United States Department of Agriculture

Natural Resources Conservation Service

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

Soil Survey of Halifax 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.

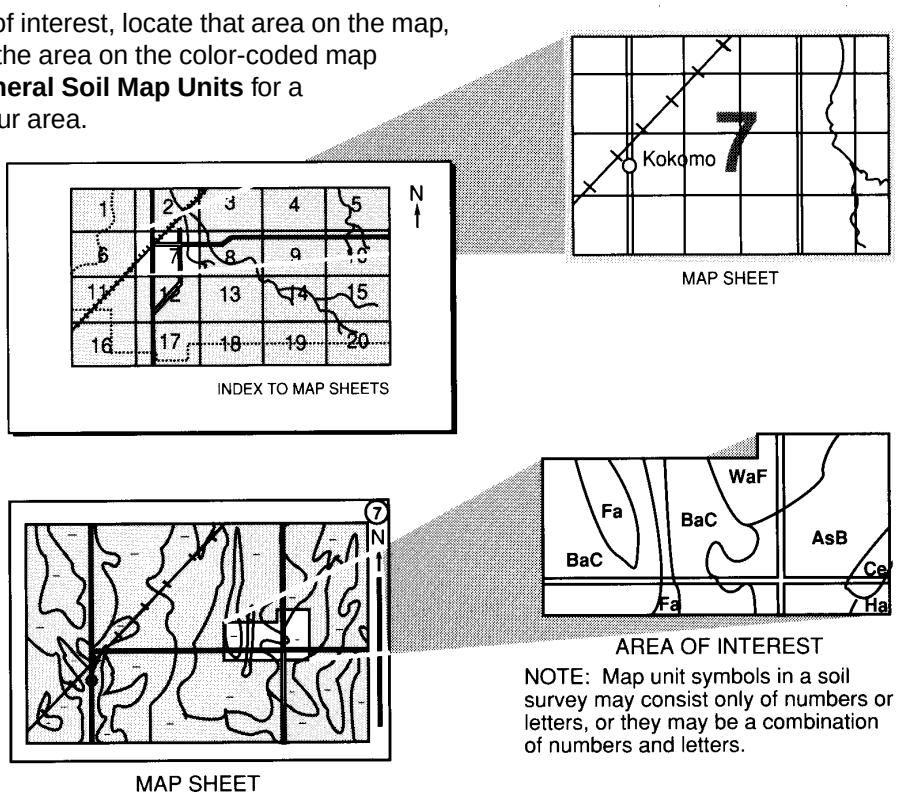
To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

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.

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



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.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **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 Natural Resources Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1993. Soil names and descriptions were approved in 1993. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1993. This soil survey was made cooperatively by the Natural Resources 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 Fishing Creek Soil and Water Conservation District; and the Halifax County Board of Commissioners. It is part of the technical assistance furnished to the Fishing Creek Soil and Water Conservation District. The Halifax County Board of Commissioners provided financial assistance for the survey, and the Fishing Creek Soil and Water Conservation District provided clerical assistance.

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 Halifax County was published in 1918 by the U.S. Department of Agriculture *(8)*. This survey updates the first survey, provides more detailed maps on aerial photographs, and contains more interpretive information.

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

Cover: Cotton on Emporia fine sandy loam, 2 to 6 percent slopes. Cotton is an important crop in Halifax County.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service home page on the World Wide Web. The address is http://www.nrcs.usda.gov (click on "Technical Resources").

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Foreword

This soil survey contains information that can be used in land-planning programs in Halifax 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.

Various regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various decisions for land use or land treatment. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

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. Wet soils are poorly suited to 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 Natural Resources Conservation Service or the North Carolina Cooperative Extension Service.

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State Conservationist
Natural Resources Conservation Service

Soil Survey of
Halifax County, North Carolina

By Deborah T. Anderson, Natural Resources Conservation Service, and Clare D. Cole, North Carolina Department of Environment, Health, and Natural Resources

Soils surveyed by Deborah T. Anderson and Eugene W. Mellette, Natural Resources Conservation Service, and by Clare D. Cole, Richard D. Hayes, and Karl Shaffer, North Carolina Department of Environment, Health, and Natural Resources

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

HALIFAX COUNTY is located in the northeastern part of North Carolina (fig. 1). It is separated from Northampton County by Lake Gaston and Roanoke Rapids Lake to the north and by the Roanoke River to the northeast. It is bounded on the east by Bertie County and on the southeast by Martin County. It is separated from Nash and Edgecombe Counties by Fishing Creek to the south. It is bounded on the west by Warren and Franklin Counties.

Halifax County is the third largest county in North Carolina. It covers 722 square miles, or 468,026 acres. In 1990, the population of the county was 55,516 *(14)*.

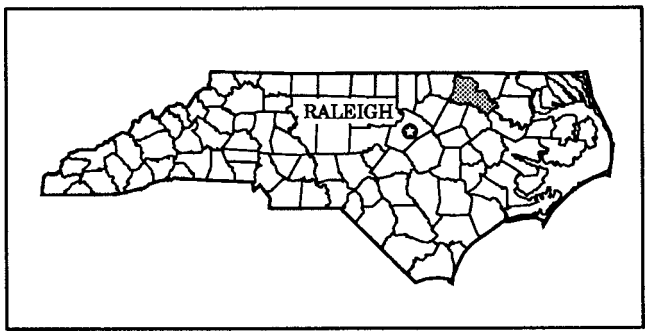

Figure 1.—Location of Halifax County in North Carolina.

General Nature of the County

This section gives general information about Halifax County. It describes the history and development; physiography, relief, and drainage; and climate.

History and Development

In 1758, Halifax County was formed from part of Edgecombe County. It was named in honor of Charles Montague, Earl of Halifax and President of the British Board of Trade. The area was originally inhabited by Indians. The Tuscarora was the dominant tribe. A community of Haliwa-Saponi Indians is currently located near the town of Hollister.

In 1758, the town of Halifax, which is situated on the Roanoke River, was established as the county seat. The majority of the early settlers were English colonists who moved south from Virginia. Some of the earliest land grants, recorded in the 1720's, were for areas along the Roanoke River and near the mouth of Kehukee and Quankey Creeks. In 1722, Highland Scots came from Virginia and settled along the Roanoke River in areas between Caledonia and Palmyra. They named their settlement Scotland Neck.

Halifax served as the center of the North Carolina State Government, and the Halifax Resolves were adopted by the Provincial Congress on April 12, 1776.

In Halifax, on November 12, 1776, the Provincial Congress drafted and approved North Carolina's first State constitution and approved the first governor.

During the Civil War, Halifax was used as a supply depot and had an arms factory. Cornwallis briefly occupied the town during his northward march to Virginia *(1)*. After the war, Halifax and the Roanoke Valley continued to prosper through use of the Roanoke River and the large areas of fertile farmland adjoining the river. Around the 1840's, because of the movement of new settlers westward and the arrival of the railroad, eastern North Carolina decreased in importance. Halifax County is now primarily an agricultural community, but textiles, forestry, paper manufacturing, and tourism also contribute to the economy.

Roanoke Rapids, which was founded in 1895 along the Roanoke River, is the largest city in Halifax County. Enfield is the oldest town in the county. It served as the county seat for Edgecombe County before the formation of Halifax County. Other cities and towns in Halifax County include Scotland Neck, Weldon, Littleton, Hobgood, and Hollister.

Agriculture dominates the economy of Halifax County. In 1994, about 105,700 acres was cultivated for crops and about 19,000 acres was used as pasture and hayland. Cotton was grown on about 39,400 acres (fig. 2), peanuts on 25,470 acres, corn on 18,800 acres, soybeans on 13,400 acres, small grain on 12,500 acres, tobacco on 3,120 acres, and sorghum on 550 acres *(7)*. The rest of the acreage is idle land or is part of the conservation reserve program. The timber industry also is important to the local economy. About 250,000 acres in the county is commercial woodland *(12)*. Loblolly pine is the dominant species.

Physiography, Relief, and Drainage

The majority of Halifax County is in the Coastal Plain physiographic province. The western part of the county is in the Piedmont province. The Fall Line region separates these two physiographic regions. The Coastal Plain province has two distinct divisions—the Atlantic Coast Flatwoods and the Southern Coastal Plain. The Atlantic Coast Flatwoods, approximately 126,300 acres in size, is in the southeastern part of the county. It is generally characterized by broad, smooth landscapes. Poorly drained and somewhat poorly drained, loamy soils and soils that have a high content of silt are the dominant soils. The Southern Coastal Plain, approximately 169,400 acres in size, is dominantly on nearly level and gently sloping landscapes. Well drained and moderately well drained, loamy and clayey soils are the dominant soils. The Fall Line region, approximately 71,100 acres in size, is mostly on gently sloping to moderately sloping landscapes. Well drained, loamy and clayey soils are the dominant soils. The Southern Piedmont, approximately 101,226 acres in size, is generally on gently sloping to moderately steep landscapes. Well drained, clayey soils are the dominant soils.

The county slopes eastward. According to U.S. Geological Survey topographic maps, the highest point in the county, located east of Littleton near Roper Springs, is 391 feet. The lowest elevation, where the Roanoke River flows out of the southeastern part of the county, is 20 feet. The depth to hard bedrock is 14 or 15 feet in the Piedmont region and ranges from 200 to 300 feet in the Coastal Plain region. The depth to soft bedrock is less than 5 feet in some areas of the Piedmont.

Halifax County is drained mainly by Fishing Creek and, to a lesser extent, by the Roanoke River. Major tributaries of Fishing Creek include Butterwood Creek, Little Fishing Creek, Marsh Swamp, Beech Swamp, Beaver Dam Swamp, Burnt Coat Swamp, and Bear Swamp. Kehukee Creek, Looking Glass Creek, Quankey Creek, Chockayotte Creek, Conocanara Swamp, and Cypress Swamp are the major tributaries of the Roanoke River.

Climate

Halifax County has long, hot summers because moist tropical air from the Gulf of Mexico persistently covers the area. Winters are cool and fairly short. A cold wave occurs rarely and moderates in 1 or 2 days. Precipitation is fairly heavy throughout the year, and prolonged droughts are rare. The amount of summer precipitation, mainly occurring as afternoon thunderstorms, is adequate for all crops.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Arcola, North Carolina, in the period 1961 to 1990. 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 40 degrees F and the average daily minimum temperature is 31 degrees. The lowest temperature on record, which occurred at Arcola on January 21, 1985, is -7 degrees. In summer, the average temperature is 76 degrees and the average daily maximum temperature is 87 degrees. The highest recorded temperature, which occurred at Arcola on July 1, 1959, is 104 degrees.

Growing degree days are shown in table 1. They

Figure 2.—An area of Emporia fine sandy loam, 2 to 6 percent slopes. This soil is well suited to cotton.

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 average annual precipitation is about 44.55 inches. Of this, 23.61 inches, or about 53 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 19 inches. The heaviest 1-day rainfall during the period of record was 8.18 inches at Arcola on October 6, 1972. Thunderstorms occur on about 44 days each year and most occur in July.

The average seasonal snowfall is 6.2 inches. The greatest snow depth at any one time during the period of record was 11 inches. On an average of 2 days, at least 1 inch of snow is on the ground.

The average relative humidity in midafternoon is about 54 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The sun shines 60 percent of the time possible in summer and 55

percent in winter. The prevailing wind is from the southwest. Average windspeed is highest, 9.3 miles per hour, in March.

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

How This Survey Was Made

This survey was made to provide information about the soils in Halifax 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 areas that are less than 2 to 5 acres in size.

General Soil Map Units

The general soil map 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. Wedowee-Pacolet

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

This map unit is in the western part of Halifax County. The landscape is characterized by upland ridges and side slopes that are dissected by numerous drainageways.

This map unit makes up about 15 percent of the county. It is about 66 percent Wedowee soils, 18 percent Pacolet soils, and 16 percent soils of minor extent.

The Wedowee soils are gently sloping to moderately steep. The surface layer is dark brown sandy loam about 7 inches thick. The subsoil extends to a depth of about 36 inches. In sequence downward, it is yellowish brown sandy loam, strong brown clay that has yellowish red mottles, strong brown clay that has brownish yellow and red mottles, and strong brown clay loam that has brownish yellow, white, and red mottles. The substratum extends to a depth of about 63 inches. It is mottled strong brown, brownish yellow, pink, white, and red saprolite of sandy clay loam.

The Pacolet soils are gently sloping. The surface layer is yellowish brown sandy loam about 8 inches thick. The subsoil extends to a depth of about 35 inches. The upper part of the subsoil is red clay, and the lower part is red clay loam. The substratum extends to a depth of about 63 inches. It is mottled white, reddish yellow, and red saprolite of sandy clay loam.

The minor soils include Helena, Chewacla, and Wehadkee soils. Helena soils are at the head of drainageways and along drainageways. Chewacla and Wehadkee soils are on flood plains.

Most of the gently sloping areas are used as cropland. The moderately sloping areas are used as cropland or woodland. The moderately steep areas are mainly used as woodland. The slope, a hazard of erosion, and permeability in the subsoil are the main limitations affecting the use and management of the Wedowee and Pacolet soils.

2. Tatum-Herndon

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

This map unit is in the southwestern part of Halifax County. The landscape is characterized by upland ridges and side slopes that are dissected by numerous drainageways.

This map unit makes up about 7 percent of the county. It is about 47 percent Tatum soils, 22 percent Herndon soils, and 31 percent soils of minor extent.

The Tatum soils are gently sloping to moderately steep. The surface layer is about 6 inches thick. It is strong brown silty clay loam that has yellowish red mottles. The subsoil extends to a depth of about 35 inches. It is red silty clay that has brownish yellow mottles. The substratum extends to a depth of about 50 inches. It is mottled yellow, light gray, weak red, and red saprolite of silt loam. Soft bedrock is at a depth of

about 50 inches. It is mottled light gray and red, strongly weathered slate rock.

The Herndon soils are gently sloping and moderately sloping. The surface layer is dark grayish brown silt loam about 4 inches thick. The subsurface layer is light yellowish brown silt loam about 4 inches thick. The subsoil extends to a depth of about 45 inches. In sequence downward, it is strong brown silty clay, strong brown silty clay that has red mottles, yellowish red silty clay that has yellow mottles, and mottled strong brown, yellowish red, yellow, and red silty clay loam. The substratum extends to a depth of about 61 inches. It is mottled light gray, yellow, pinkish white, and red saprolite of silt loam.

The minor soils include Lignum, Chewacla, and Wehadkee soils. Lignum soils are on broad flats, at the head of drainageways, and along drainageways. Chewacla and Wehadkee soils are on flood plains.

Most of the gently sloping areas are used as cropland. The moderately sloping areas are used as cropland or woodland. The moderately steep areas are mainly used as woodland. The slope, a hazard of erosion, the depth to soft bedrock, the shrink-swell potential, and permeability in the subsoil are the main limitations affecting the use and management of the Tatum soils. The slope, a hazard of erosion, and permeability in the subsoil are the main limitations affecting the use and management of the Herndon soils.

3. Wedowee-Emporia

Nearly level to moderately steep, well drained soils that have a loamy surface layer and a clayey or loamy subsoil; on uplands of the Fall Line

This map unit is in the central part of Halifax County, in the Fall Line region. The landscape is characterized by upland ridges and side slopes.

This map unit makes up about 10 percent of the county. It is about 35 percent Wedowee soils, 34 percent Emporia soils, and 31 percent soils of minor extent.

The Wedowee soils are gently sloping to moderately steep. The surface layer is dark brown sandy loam about 7 inches thick. The subsoil extends to a depth of about 36 inches. In sequence downward, it is yellowish brown sandy loam, strong brown clay that has yellowish red mottles, strong brown clay that has brownish yellow and red mottles, and strong brown clay loam that has brownish yellow, white, and red mottles. The substratum extends to a depth of about 63 inches. It is mottled strong brown, brownish yellow, pink, white, and red saprolite of sandy clay loam.

The Emporia soils are nearly level to moderately sloping. The surface layer is brown fine sandy loam about 10 inches thick. The subsurface layer is yellowish brown fine sandy loam about 7 inches thick. The subsoil extends to a depth of about 58 inches. The upper part of the subsoil is yellowish brown sandy clay loam, and the lower part is yellowish brown clay that has gray, red, and brownish yellow mottles. The substratum extends to a depth of about 67 inches. It is mottled yellowish brown, gray, strong brown, and red clay loam that has thin strata of sandy loam.

The minor soils include Chewacla, Wehadkee, and Nankin soils. Chewacla and Wehadkee soils are on flood plains. Nankin soils are on the higher knobs and ridges.

Most of the nearly level and gently sloping areas are used as cropland. The moderately sloping areas are used as cropland or woodland. The slope, a hazard of erosion, and permeability in the subsoil are the main limitations affecting the use and management of the Wedowee and Emporia soils. The Emporia soils also have a perched water table and a shrink-swell potential.

4. Dothan-Fuquay

Nearly level and gently sloping, well drained soils that have a sandy surface layer and a loamy subsoil; on uplands of the Fall Line

This map unit is in the central part of Halifax County, in the Fall Line region. The landscape is characterized by broad, smooth, upland ridges.

This map unit makes up about 5 percent of the county. It is about 37 percent Dothan soils, 27 percent Fuquay soils, and 36 percent soils of minor extent.

The Dothan soils are nearly level and gently sloping. The surface layer is brown loamy sand about 9 inches thick. The subsurface layer is yellowish brown loamy sand about 8 inches thick. The subsoil extends to a depth of about 72 inches. In sequence downward, it is yellowish brown sandy clay loam that has yellowish red mottles and few plinthite nodules, yellowish brown sandy clay that has yellowish red mottles and common plinthite nodules, red sandy clay that has yellowish red mottles and common plinthite nodules, and reticulately mottled red, yellowish red, and pinkish gray sandy loam that has pockets of sandy clay loam.

The Fuquay soils are nearly level and gently sloping. The surface layer is brown sand about 9

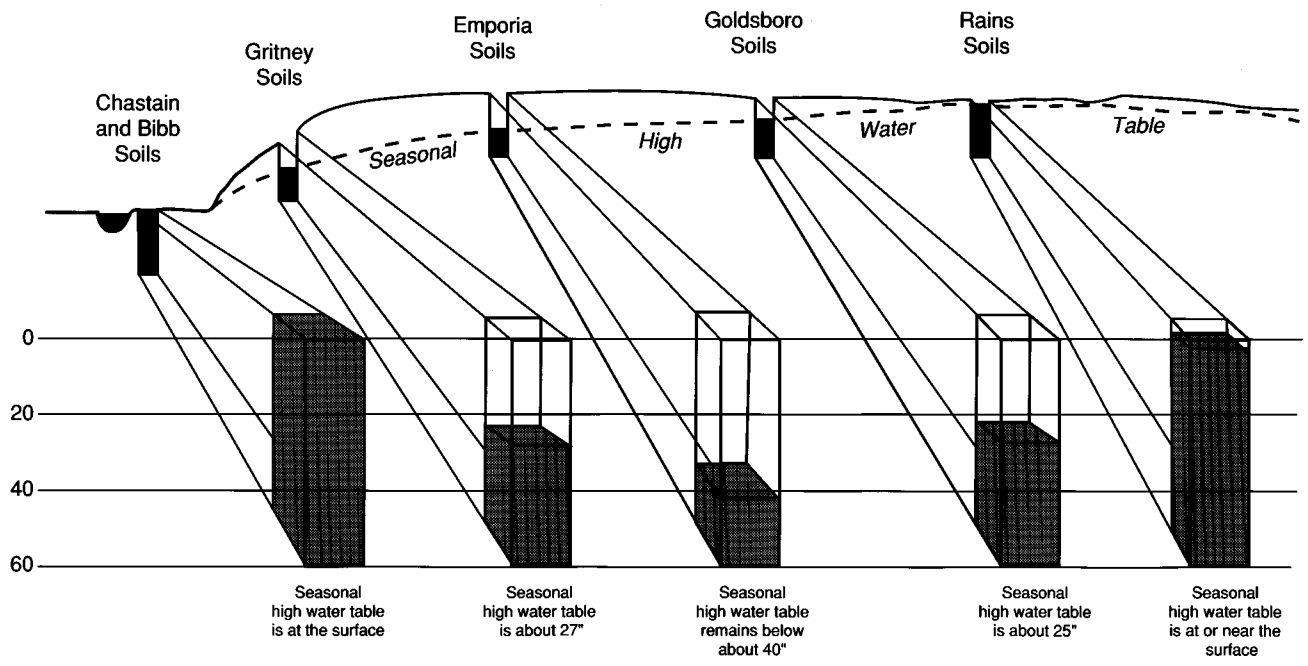

Figure 3.—A generalized landscape of Halifax County showing the relative location of some important soils and depth to the seasonal high water table.

inches thick. The subsurface layer is light yellowish brown loamy sand about 16 inches thick. The subsoil extends to a depth of about 70 inches. In sequence downward, it is yellowish brown sandy loam that has strong brown mottles; light yellowish brown sandy loam that has very pale brown mottles; yellowish brown sandy clay loam that has red and light brownish gray mottles and common plinthite nodules; reticulately mottled red, light brownish gray, and strong brown sandy clay loam that has pockets of sandy clay and common plinthite nodules; and reticulately mottled red, light brownish gray, and strong brown sandy loam that has pockets of clay loam and common plinthite nodules.

The minor soils include Bibb, Chastain, Emporia, Goldsboro, and Wedowee soils. Bibb and Chastain soils are on flood plains. Emporia and Wedowee soils are on side slopes and the narrower ridges. Goldsboro soils are on flats, in depressions, and along drainageways.

Most of this map unit is used as cropland. A hazard of soil blowing, the droughtiness of the sandy surface layer, a water table that is perched above the plinthic layer, and the permeability in the lower part of the subsoil are the main limitations affecting the use and management of the Dothan and Fuquay soils.

5. Emporia-Goldsboro-Gritney

Nearly level to moderately sloping, well drained and moderately well drained soils that have a loamy surface layer and a loamy or clayey subsoil; on uplands of the Coastal Plain

This map unit is in the central part of Halifax County. The landscape is characterized by broad, smooth, upland ridges, flats, and depressions with side slopes adjacent to drainageways and flood plains (fig. 3).

This map unit makes up about 28 percent of the county. It is about 34 percent Emporia soils, 12 percent Goldsboro soils, 11 percent Gritney soils, and 43 percent soils of minor extent.

The Emporia soils are nearly level to moderately sloping and are well drained. The surface layer is brown fine sandy loam about 10 inches thick. The subsurface layer is yellowish brown fine sandy loam about 7 inches thick. The subsoil extends to a depth of about 58 inches. The upper part of the subsoil is yellowish brown sandy clay loam, and the lower part is yellowish brown clay that has gray, red, and brownish yellow mottles. The substratum extends to a depth of about 67 inches. It is mottled yellowish brown, gray,

strong brown, and red clay loam that has thin strata of sandy loam.

The Goldsboro soils are nearly level and are moderately well drained. The surface layer is brown fine sandy loam about 7 inches thick. The subsoil extends to a depth of about 72 inches. In sequence downward, it is brownish yellow sandy clay loam; yellowish brown sandy clay loam that has strong brown mottles; yellowish brown sandy clay loam that has strong brown and gray mottles; mottled yellowish brown, gray, and strong brown sandy clay loam; and mottled yellowish brown, gray, strong brown, and red sandy clay loam.

The Gritney soils are gently sloping to moderately sloping and are moderately well drained. The surface layer is yellowish brown fine sandy loam about 6 inches thick. The subsoil extends to a depth of about 57 inches. In sequence downward, it is yellowish brown sandy clay loam; yellowish brown clay that has yellowish red mottles; mottled yellowish brown, light gray, red, brownish yellow, and dark yellowish brown clay; and mottled yellowish brown, light gray, red, brownish yellow, and dark yellowish brown clay that has pockets of sandy clay loam. The substratum extends to a depth of about 60 inches. It is mottled yellowish brown, light gray, red, brownish yellow, and dark yellowish brown clay loam.

The minor soils include Bonneau, Chastain, Bibb, and Rains soils. Bonneau soils are in areas intermingled with the Emporia and Gritney soils. Chastain and Bibb soils are on flood plains. Rains soils are on flats, in depressions, and along drainageways.

Most of the nearly level and gently sloping areas are used as cropland. The moderately sloping areas are used as cropland or woodland. The slope, a hazard of erosion, a perched water table, the shrink-swell potential, and permeability in the subsoil are the main limitations affecting the use and management of the Emporia and Gritney soils. A high water table is the main limitation affecting the use and management of the Goldsboro soils.

6. Grantham-Exum

Nearly level, poorly drained and moderately well drained soils that have a loamy surface layer and a loamy subsoil; on uplands of the Coastal Plain

This map unit is in the southeastern part of Halifax County. The landscape is characterized by broad, smooth, upland flats and depressions.

This map unit makes up about 7 percent of the county. It is about 32 percent Grantham soils, 26 percent Exum soils, and 42 percent soils of minor extent.

The Grantham soils are poorly drained. The surface layer is very dark gray loam about 8 inches thick. The subsurface layer is about 4 inches thick. It is light brownish gray loam that has yellow mottles. The subsoil extends to a depth of about 75 inches. In sequence downward, it is light brownish gray loam that has brownish yellow and strong brown mottles; light gray loam that has brownish yellow and strong brown mottles; light brownish gray loam that has light gray, brownish yellow, and red mottles; and light brownish gray clay loam that has brownish yellow and strong brown mottles.

The Exum soils are moderately well drained. The surface layer is gray silt loam about 9 inches thick. The subsurface layer is light yellowish brown silt loam about 6 inches thick. The subsoil extends to a depth of about 62 inches. The upper part of the subsoil is yellowish brown silt loam. The next part is yellowish brown loam that has light brownish gray mottles. The lower part is yellowish brown loam that has light brownish gray and strong brown mottles.

The minor soils include Nahunta, Aycock, Gritney, Emporia, Chastain, and Bibb soils. Nahunta soils are in areas intermingled with the Grantham soils. Aycock soils are on the higher knobs and ridges. Gritney and Emporia soils are on side slopes and the narrower ridges. Chastain and Bibb soils are on flood plains.

Most drained areas of this map unit are used as cropland. Areas of poorly drained soils that are not artificially drained are used as woodland. A high water table and permeability in the subsoil are the main limitations affecting the use and management of the Grantham and Exum soils.

7. Noboco-Goldsboro-Gritney

Nearly level to moderately sloping, well drained and moderately well drained soils that have a loamy surface layer and a loamy or clayey subsoil; on uplands of the Coastal Plain

This map unit is in the southeastern part of Halifax County. The landscape is characterized by broad, smooth, upland ridges, flats, and depressions with side slopes adjacent to drainageways and flood plains.

This map unit makes up about 4 percent of the county. It is about 18 percent Noboco soils, 17 percent Goldsboro soils, 16 percent Gritney soils, and 49 percent soils of minor extent.

The Noboco soils are nearly level and are well drained. The surface layer is yellowish brown fine sandy loam about 10 inches thick. The subsurface layer is about 8 inches thick. It is very pale brown fine sandy loam that has brownish yellow mottles. The subsoil extends to a depth of about 64 inches. In sequence downward, it is yellowish brown sandy clay loam; yellowish brown sandy clay loam that has yellowish red and pale yellow mottles; yellowish brown sandy clay loam that has light gray, yellowish red, and strong brown mottles; and yellowish brown sandy clay loam that has light gray, yellowish red, and red mottles and pockets of sandy clay.

The Goldsboro soils are nearly level and are moderately well drained. The surface layer is brown fine sandy loam about 7 inches thick. The subsoil extends to a depth of about 72 inches. In sequence downward, it is brownish yellow sandy clay loam; yellowish brown sandy clay loam that has strong brown mottles; yellowish brown sandy clay loam that has gray and strong brown mottles; mottled yellowish brown, gray, and strong brown sandy clay loam; and mottled yellowish brown, gray, strong brown, and red sandy clay loam.

The Gritney soils are gently sloping to moderately sloping and are moderately well drained. The surface layer is yellowish brown fine sandy loam about 6 inches thick. The subsoil extends to a depth of about 57 inches. In sequence downward, it is yellowish brown sandy clay loam; yellowish brown clay that has yellowish red mottles; mottled yellowish brown, light gray, red, brownish yellow, and dark yellowish brown clay; and mottled yellowish brown, light gray, red, brownish yellow, and dark yellowish brown clay that has pockets of sandy clay loam. The substratum extends to a depth of about 60 inches. It is mottled yellowish brown, light gray, red, brownish yellow, and dark yellowish brown clay loam.

The minor soils include Emporia, Bonneau, Rains, and Bethera soils. Emporia soils are on side slopes and the narrower ridges. Bonneau soils are in areas intermingled with the Noboco soils. Rains and Bethera soils are on flats, in depressions, and along drainageways.

Most of the nearly level and gently sloping areas are used as cropland. The moderately sloping areas are used as cropland or woodland. A high water table is the main limitation affecting the use and management of the Noboco and Goldsboro soils. The slope, a hazard of erosion, a perched water table, the shrink-swell potential, and permeability in the subsoil are the main limitations affecting the use and management of the Gritney soils.

8. Roanoke-Dogue

Nearly level, poorly drained and moderately well drained soils that have a loamy surface layer and a clayey subsoil; on fluvial terraces

This map unit generally occurs along the Roanoke River and its major tributaries and commonly occurs in areas adjacent to the State-Altavista general soil map unit. The landscape is characterized by broad, smooth flats and depressions. The map unit may be occasionally flooded for brief periods.

This map unit makes up about 6 percent of Halifax County. It is about 31 percent Roanoke soils, 29 percent Dogue soils, and 40 percent soils of minor extent.

The Roanoke soils are poorly drained. The surface layer is very dark gray loam about 5 inches thick. The subsurface layer is about 3 inches thick. It is grayish brown loam that has yellowish brown mottles. The subsoil extends to a depth of about 52 inches. It is gray clay that has light yellowish brown and strong brown mottles. The substratum extends to a depth of about 70 inches. It is mottled light brownish gray and yellowish red loam.

The Dogue soils are moderately well drained. The surface layer is dark grayish brown silt loam about 4 inches thick. The subsurface layer is light yellowish brown loam about 4 inches thick. The subsoil extends to a depth of about 53 inches. In sequence downward, it is yellow loam; brownish yellow clay loam that has strong brown mottles; brownish yellow clay that has strong brown and light gray mottles; mottled brownish yellow, strong brown, and light gray clay; and mottled strong brown and light gray sandy clay loam that has pockets of sandy clay. The substratum extends to a depth of about 62 inches. It is mottled yellow, brownish yellow, strong brown, and light gray sandy clay loam.

The minor soils include Chastain, Bibb, Wahee, and Winton soils. Chastain and Bibb soils are on flood plains. Wahee soils are in areas intermingled with the Roanoke soils. Winton soils are on bluffs along the Roanoke River and on side slopes adjacent to drainageways and flood plains.

Most of this map unit is used as woodland. A high water table and permeability in the subsoil are the main limitations affecting the use and management of the Roanoke and Dogue soils. In addition, the Roanoke soils have a hazard of occasional flooding and the Dogue soils have a shrink-swell potential.

9. State-Altavista

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

This map unit generally occurs along the Roanoke River, Fishing Creek, and the larger streams in Halifax County and commonly occurs in areas adjacent to the Chewacla-Riverview general soil map unit. The landscape is characterized by broad, smooth ridges, flats, and depressions. The map unit may be rarely flooded, and some areas along Fishing Creek may be flooded more often.

This map unit makes up about 10 percent of the county. It is about 49 percent State soils, 10 percent Altavista soils, and 41 percent soils of minor extent.

The State soils are nearly level and gently sloping and are well drained. The surface layer is dark yellowish brown fine sandy loam about 6 inches thick. The subsoil extends to a depth of about 53 inches. The upper part of the subsoil is strong brown sandy clay loam, and the lower part is strong brown fine sandy loam. The substratum extends to a depth of about 75 inches. It is very fine sandy loam. It is strong brown in the upper part and yellowish brown in the lower part.

The Altavista soils are nearly level and are moderately well drained. The surface layer is dark brown fine sandy loam about 8 inches thick. The subsurface layer is brownish yellow fine sandy loam about 4 inches thick. The subsoil extends to a depth of about 50 inches. The upper part of the subsoil is strong brown sandy clay loam. The next part is strong brown sandy clay loam that has gray and red mottles. The lower part is mottled reddish yellow, gray, and strong brown fine sandy loam. The substratum extends to a depth of about 62 inches. It is mottled reddish yellow, gray, and strong brown sandy loam that has thin strata of sandy clay loam.

The minor soils include Chastain, Bibb, Chewacla, and Wehadkee soils. These soils are on flood plains.

Most of this map unit is used as cropland. A hazard of erosion and a high water table are the main limitations affecting the use and management of the State soils. The hazard of rare flooding and a high water table are the main limitations affecting the use and management of the Altavista soils.

10. Chewacla-Riverview

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

This map unit is adjacent to the Roanoke River. The landscape is characterized by nearly level, broad, smooth flats that are dissected by slightly higher, nearly level ridges in some areas. The map unit may be frequently or occasionally flooded for brief to long periods.

This map unit makes up about 2 percent of Halifax County. It is about 54 percent Chewacla soils, 25 percent Riverview soils, and 21 percent soils of minor extent.

The Chewacla soils are somewhat poorly drained. The surface layer is dark brown loam about 4 inches thick. The subsoil extends to a depth of about 60 inches. In sequence downward, it is dark yellowish brown silty clay loam that has brown mottles, dark yellowish brown clay loam that has grayish brown and strong brown mottles, dark brown loam that has gray mottles, strong brown clay loam that has gray mottles, and mottled gray, strong brown, and red clay loam. The substratum extends to a depth of about 72 inches. It is mottled dark brown and gray loam.

The Riverview soils are well drained. The surface layer is very dark grayish brown loam about 6 inches thick. The subsoil extends to a depth of about 32 inches. The upper part of the subsoil is strong brown fine sandy loam, and the lower part is strong brown clay loam. The substratum extends to a depth of about 50 inches. In sequence downward, it is strong brown fine sandy loam, brown fine sandy loam, dark brown loam, and strong brown fine sandy loam.

The minor soils include Wehadkee soils. These soils are in depressions and areas of back swamps.

Most of this map unit is used as cropland. The hazard of frequent or occasional flooding and a high water table are the main limitations affecting the use and management of the Chewacla and Riverview soils.

11. Chastain-Bibb

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

This map unit is along major creeks and streams on the Coastal Plain. The landscape is characterized by nearly level, broad, smooth flats. The map unit may be frequently flooded for brief to very long periods.

This map unit makes up about 6 percent of Halifax County. It is about 49 percent Chastain soils, 33 percent Bibb soils, and 18 percent soils of minor extent.

The surface layer of the Chastain soils is very dark grayish brown clay loam about 5 inches thick. The subsoil extends to a depth of about 54 inches. In

sequence downward, it is grayish brown silty clay that has strong brown mottles, gray clay that has strong brown mottles, gray clay that has strong brown and yellowish red mottles, and dark gray clay that has strong brown mottles. The substratum extends to a depth of about 72 inches. It is light brownish gray silty clay that has dark gray and strong brown mottles.

The surface layer of the Bibb soils extends to a depth of about 10 inches. The upper part of the surface layer is dark grayish brown loam, and the lower part is grayish brown fine sandy loam. The substratum extends to a depth of about 66 inches. The upper part of the substratum is light brownish gray fine sandy loam that has yellowish brown mottles. The next part is gray fine sandy loam. The lower part is dark gray coarse sand.

The minor soils include Altavista, Roanoke, and Tomotley soils. These soils are on the higher terraces adjacent to rivers and streams.

Most of this map unit is used as woodland. The hazard of frequent flooding and a high water table are the main limitations affecting the use and management of the Chastain and Bibb soils.

Detailed Soil Map Units

The map units on the detailed soil maps represent the soils in the survey area at a mapping scale of 1:24,000. 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, 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 or features that affect use or management. For example, Tatum silty clay loam, 2 to 6 percent slopes, eroded, is a map unit of the Tatum series that identifies surface texture, degree of erosion, and slope group as the dominant soil features affecting use or management.

Some map units are made up of two or more major soils. These map units are called soil complexes or undifferentiated groups.

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. Emporia-Wedowee complex, 2 to 6 percent slopes, is an example.

An *undifferentiated group* is made up of two or more dominant soils that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils in a mapped area are not uniform. An area can be made up of only one of the major soils, or it can be made up of all of them. Chastain and Bibb soils, 0 to 1 percent slopes, frequently flooded, is an undifferentiated group in this survey area.

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. The 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 "Contents") 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.

AaA—Altavista fine sandy loam, 0 to 3 percent slopes, rarely flooded. This nearly level, very deep, moderately well drained soil is on broad, smooth flats, in depressions, and along drainageways on fluvial terraces along the Roanoke River, Fishing Creek, and the larger streams in the county. Individual areas are long and narrow and range from about 5 to 50 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 8 inches—dark brown fine sandy loam

Subsurface layer:
8 to 12 inches—brownish yellow fine sandy loam

Subsoil:
12 to 23 inches—strong brown sandy clay loam
23 to 36 inches—strong brown sandy clay loam that has gray and red mottles

36 to 50 inches—mottled reddish yellow, gray, and strong brown fine sandy loam

Substratum:
50 to 62 inches—mottled reddish yellow, gray, and strong brown sandy loam that has thin strata of sandy clay loam

Important soil properties—

Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Slow
Hazard of water erosion: Slight
High water table: At a depth of 1.5 to 2.5 feet from December through April

Included with this unit in mapping are a few areas of State, Tomotley, and Dogue soils. The well drained State soils are in the slightly higher areas. The poorly drained Tomotley soils are in the slightly lower areas. Dogue soils have a clayey subsoil. They are intermingled with the Altavista soil in some areas. Some areas along Fishing Creek may be more than rarely flooded (fig. 4). Also included are small areas of soils that have major properties, use, and management similar to those of the Altavista soil but have more silt in the subsoil. Dissimilar inclusions make up about 15 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as woodland or pasture.

In cultivated areas of this Altavista soil, the major crops are corn, soybeans, peanuts, cotton, and small grain. The hazard of flooding and the high water table are the main limitations affecting cropland. Cultivation may be delayed during wet periods. Artificial drainage systems may be needed to remove excess water. Planting winter cover crops, managing crop residue, and conservation tillage help to maintain tilth and conserve moisture. In areas where slopes are 3 percent, conservation practices, such as no-till planting, stripcropping, crop rotations, contour farming, field borders, grassed waterways, and terraces and diversions, can also help to conserve moisture and control erosion.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species is the main limitation affecting use and management. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 96 feet.

The hazard of flooding and the high water table are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Because of the hazard of rare flooding, sites for dwellings and septic tank absorption fields should be selected on more suitable soils.

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

AyA—Aycock silt loam, 0 to 3 percent slopes. This nearly level, very deep, well drained soil is on broad, smooth, upland ridges of the Coastal Plain. Individual areas are irregular in shape and range from about 10 to 30 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 6 inches—brown silt loam

Subsurface layer:
6 to 10 inches—light yellowish brown silt loam

Subsoil:
10 to 26 inches—yellowish brown loam that has reddish yellow mottles
26 to 42 inches—yellowish brown loam that has reddish yellow, yellowish red, and red mottles
42 to 60 inches—yellowish brown loam that has reddish yellow, yellowish red, red, and gray mottles
60 to 74 inches—mottled strong brown, yellowish brown, red, and gray clay loam

Important soil properties—

Permeability: Moderately slow
Available water capacity: High
Surface runoff: Slow
Hazard of water erosion: Moderate
High water table: At a depth of 3.5 to 6.0 feet from January through April

Included with this unit in mapping are a few areas of Exum and Nahunta soils. The moderately well drained Exum soils and the somewhat poorly drained Nahunta soils are on flats, in depressions, and along drainageways. Also included are small areas of soils that have major properties, use, and management similar to those of the Aycock soil but have a surface layer of fine sandy loam. Dissimilar inclusions make up about 10 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as woodland or pasture.

In cultivated areas of this Aycock soil, the major crops are peanuts, cotton, corn, and tobacco. The hazard of erosion is the main limitation affecting cropland. Planting winter cover crops and managing crop residue help to control runoff and erosion and

Figure 4.—Flooding along Fishing Creek in an area of Altavista fine sandy loam, 0 to 3 percent slopes, rarely flooded.

maintain tilth. In areas where slopes are 3 percent, conservation practices, such as no-till planting, stripcropping, crop rotations, contour farming, field borders, grassed waterways, and terraces and diversions, can also help to conserve water and control erosion.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species is the main limitation affecting use and management. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 84 feet.

The high water table and the moderately slow permeability in the subsoil are the main limitations

affecting building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing a drainage system around the septic tank absorption field may be needed to minimize problems caused by wetness and prevent the contamination of ground water. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. A specially designed septic system may be needed.

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

BaA—Bethera loam, 0 to 1 percent slopes. This nearly level, very deep, poorly drained soil is on broad, smooth, upland flats, in depressions, and along drainageways of the Coastal Plain. Individual areas are irregular in shape and generally range from about 10 to 200 acres in size. A few areas are as much as 500 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 7 inches—very dark gray loam

Subsoil:
7 to 13 inches—light brownish gray silt loam that has reddish yellow mottles
13 to 35 inches—gray clay that has reddish yellow mottles
35 to 52 inches—gray silty clay that has light yellowish brown and reddish yellow mottles
52 to 63 inches—light brownish gray silty clay that has light gray and reddish yellow mottles

Important soil properties—

Permeability: Slow or moderately slow
Available water capacity: High
Surface runoff: Very slow
Hazard of water erosion: Slight
High water table: Within a depth of 1.5 feet from December through April

Included with this unit in mapping are a few areas of Lynchburg, Grantham, and Rains soils. These soils have a loamy subsoil. The somewhat poorly drained Lynchburg soils are in the slightly higher areas. Grantham and Rains soils are intermingled with the Bethera soil in some areas. Dissimilar inclusions make up about 20 percent of this map unit.

Most of this map unit is used as woodland. The rest is mainly used as cropland or pasture.

In drained and cultivated areas of this Bethera soil, the major crops are corn, soybeans, and small grain. The high water table and the slow or moderately slow permeability in the subsoil are the main limitations affecting cropland. Cultivation may be delayed during wet periods. Artificial drainage systems may be needed to remove excess water, but a lack of suitable outlets and the permeability can restrict the use of many drainage systems.

In wooded areas, this soil is managed primarily for loblolly pine. The high water table, competition from undesirable plant species, and a hazard of windthrow are the main limitations affecting woodland. The use of equipment may be restricted to periods when the soil is dry. Artificial drainage systems may be needed to remove excess water, but a lack of suitable outlets can restrict the use of many drainage systems. Intensive site preparation, such as chopping, burning, and bedding, can help to establish seedlings, reduce the seedling mortality rate, and reduce the competition from undesirable plant species. Thinning stands carefully, avoiding damage to surficial root systems, and periodically removing windthrown trees may be needed. Based on a 50-year site curve, the mean site index for loblolly pine is 92 feet where the soil is drained. Based on a 50-year site index, the mean site index for sweetgum is 95 feet where the soil is undrained.

The high water table and the slow permeability in the subsoil are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize some of the problems caused by wetness. Installing a drainage system around the septic tank absorption field may be needed to minimize problems caused by wetness and prevent the contamination of ground water. A lack of suitable outlets may be a problem in some areas. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. A specially designed septic system may be needed.

The land capability subclass is IIIw in drained areas and VIw in undrained areas. Based on loblolly pine as the indicator species, the woodland ordination symbol is 10W in drained areas. Based on sweetgum as the indicator species, it is 8W in undrained areas.

BcA—Bojac loamy fine sand, 0 to 3 percent slopes. This nearly level, very deep, well drained soil is on broad, smooth ridges on fluvial terraces along

Fishing Creek. Individual areas are irregular in shape and range from about 10 to 50 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 12 inches—brown loamy fine sand

Subsurface layer:
12 to 18 inches—brownish yellow loamy fine sand

Subsoil:
18 to 31 inches—strong brown fine sandy loam
31 to 39 inches—strong brown sandy clay loam
39 to 53 inches—yellowish brown fine sandy loam

Substratum:
53 to 74 inches—yellow loamy fine sand that has yellow mottles

Important soil properties—

Permeability: Moderately rapid
Available water capacity: Low
Surface runoff: Slow
Hazard of water erosion: Slight
High water table: At a depth of 4.0 to 6.0 feet from November through April

Included with this unit in mapping are a few areas of State and Tarboro soils. These soils are intermingled with the Bojac soil in some areas. State soils have more clay in the subsoil. The somewhat excessively drained Tarboro soils are sandy throughout. Also included are small areas of soils that have major properties, use, and management similar to those of the Bojac soil but have a sandy surface layer that is more than 20 inches thick. Dissimilar inclusions make up about 20 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as woodland or pasture.

In cultivated areas of this Bojac soil, the major crops are peanuts, cotton, corn, and soybeans. The droughtiness of the thick, sandy surface layer, a hazard of soil blowing, the low available water capacity, and the leaching of plant nutrients are the main limitations affecting cropland. Irrigation may be needed during dry periods. Blowing sand may damage young plants. Planting winter cover crops, managing crop residue, conservation tillage, establishing windbreaks, and including close-growing grasses and legumes in the cropping system help to control soil blowing, maintain tilth, and conserve moisture. Fertilizers, particularly nitrogen, should be used in split applications.

In wooded areas, this soil is managed primarily for loblolly pine. The droughtiness of the thick, sandy surface layer and competition from undesirable plant species are the main limitations affecting woodland. Seedling mortality is a concern during dry periods. Intensive site preparation, such as chopping, burning, and applying herbicides, can help to establish seedlings, reduce the seedling mortality rate, and reduce the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 80 feet.

The high water table is the main limitation affecting building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing a drainage system around the septic tank absorption field may be needed to minimize problems caused by wetness and prevent the contamination of ground water. A specially designed septic system may be needed.

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

BoB—Bonneau loamy fine sand, 0 to 4 percent slopes. This nearly level and gently sloping, very deep, well drained soil is on broad, smooth, upland ridges of the Coastal Plain. Individual areas are irregular in shape and range from about 10 to 300 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 9 inches—dark brown loamy fine sand

Subsurface layer:
9 to 23 inches—pale brown loamy fine sand

Subsoil:
23 to 31 inches—yellowish brown fine sandy loam
31 to 36 inches—yellowish brown fine sandy loam that has yellowish red and light yellowish brown mottles
36 to 54 inches—strong brown sandy clay loam that has red and gray mottles
54 to 66 inches—mottled red, gray, and yellowish brown sandy clay loam

Important soil properties—

Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Slow
Hazard of water erosion: Slight
High water table: At a depth of 3.0 to 5.0 feet from December through March

Included with this unit in mapping are a few areas of Emporia, Noboco, and Fuquay soils. Emporia and Noboco soils do not have a sandy surface layer that is more than 20 inches thick. They are intermingled with the Bonneau soil in some areas. Fuquay soils have more than 5 percent plinthite, by volume, in the subsoil. Dissimilar inclusions make up about 13 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as woodland or pasture.

In cultivated areas of this Bonneau soil, the major crops are peanuts, cotton, soybeans, tobacco, and corn. The droughtiness of the thick, sandy surface layer, a hazard of soil blowing, and the leaching of plant nutrients are the main limitations affecting cropland. Irrigation may be needed during dry periods. Blowing sand may damage young plants. Planting winter cover crops, managing crop residue, conservation tillage, establishing windbreaks, and including close-growing grasses and legumes in the cropping system help to control soil blowing, maintain tilth, and conserve moisture. Fertilizers, particularly nitrogen, should be used in split applications.

In wooded areas, this soil is managed primarily for loblolly pine. The droughtiness of the thick, sandy surface layer is the main limitation affecting use and management. Seedling mortality is a concern during dry periods. When dry, the sandy layers are soft and may limit the use of equipment. Based on a 50-year site curve, the mean site index for loblolly pine is 80 feet.

The high water table is the main limitation affecting building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing diversions that intercept runoff from the higher areas can also minimize problems caused by wetness that affect septic tank absorption fields. A specially designed septic system may be needed.

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

CbA—Chastain and Bibb soils, 0 to 1 percent slopes, frequently flooded. These nearly level, very deep, poorly drained soils are on flood plains of the Coastal Plain. Because these soils react similarly to most kinds of use and management, they were not separated in mapping. Typically, this map unit is about 50 percent Chastain soil, 30 percent Bibb soil, and 20 percent other soils. In some mapped areas Chastain and Bibb soils both occur, and in others only one of the soils occurs. Individual areas are long and broad and range from about 50 to 300 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this Chastain soil are as follows—

Surface layer:
0 to 5 inches—very dark grayish brown clay loam

Subsoil:
5 to 12 inches—grayish brown silty clay that has strong brown mottles
12 to 25 inches—gray clay that has strong brown mottles
25 to 36 inches—gray clay that has strong brown and yellowish red mottles
36 to 54 inches—dark gray clay that has strong brown mottles

Substratum:
54 to 72 inches—light brownish gray silty clay that has dark gray and strong brown mottles

Typically, the sequence, depth, color, and texture of the layers of this Bibb soil are as follows—

Surface layer:
0 to 5 inches—dark grayish brown loam
5 to 10 inches—grayish brown fine sandy loam

Substratum:
10 to 20 inches—light brownish gray fine sandy loam that has yellowish brown mottles
20 to 36 inches—gray fine sandy loam
36 to 66 inches—dark gray coarse sand

Important soil properties of this Chastain soil—

Permeability: Slow
Available water capacity: Moderate
Surface runoff: Very slow
Hazard of water erosion: Slight
High water table: Within a depth 1.0 foot from November through May

Important soil properties of this Bibb soil—

Permeability: Moderate in the upper part of the subsoil and moderately rapid in the lower part
Available water capacity: Moderate
Surface runoff: Very slow
Hazard of water erosion: Slight
High water table: At a depth of 0.5 to 1.0 foot from December through April

Included with this unit in mapping are a few areas of Chewacla and Riverview soils. The somewhat poorly drained Chewacla soils and the well drained Riverview soils have a loamy subsoil. They are on natural levees along the larger streams or in the slightly higher areas.

Also included are small areas of soils that have major properties, use, and management similar to those of the Chastain and Bibb soils. These soils have a loamy subsoil. Dissimilar inclusions make up about 5 percent of this map unit.

Most of this map unit is used as woodland. The map unit is rarely used as cropland or pasture.

The hazard of flooding and the high water table are the main limitations affecting cropland in areas of these Chastain and Bibb soils. A lack of suitable outlets may restrict the use of artificial drainage systems.

In wooded areas, these soils are primarily unmanaged. The hazard of flooding, the high water table, competition from undesirable plant species, a hazard of windthrow, and the high content of clay in the upper 10 inches of the Chastain soil are the main limitations affecting woodland. The use of equipment may be restricted to periods when the soils are dry. The lack of suitable outlets may restrict the use of artificial drainage systems. Intensive site preparation, such as chopping, burning, and bedding, can help to establish seedlings, reduce the seedling mortality rate, and reduce the competition from undesirable plant species. Thinning stands carefully, avoiding damage to surficial root systems, and periodically removing windthrown trees may be needed. Unsurfaced roads may be impassable during wet periods because of the high content of clay in the upper 10 inches of the Chastain soil. Logging during the drier periods helps to prevent rutting of the surface layer and possible root damage from compaction. Based on a 50-year site curve, the mean site index for sweetgum is 95 feet in areas of the Chastain soil and 90 feet in areas of the Bibb soil.

The hazard of flooding, the high water table, and the very slow permeability in the Chastain soil are the main limitations affecting building site development and septic tank absorption fields in areas of this map unit. Because of the hazard of frequent flooding, sites for dwellings and septic tank absorption fields should be selected on more suitable soils.

The land capability subclass is VIIw in areas of the Chastain soil and Vw in areas of the Bibb soil. Based on sweetgum as the indicator species, the woodland ordination symbol is 8W in areas of both soils.

ChA—Chewacla loam, 0 to 1 percent slopes, occasionally flooded. This nearly level, very deep, somewhat poorly drained soil is on flood plains along the Roanoke River. Individual areas are long and irregular in shape and range from about 10 to 200 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 4 inches—dark brown loam

Subsoil:
4 to 14 inches—dark yellowish brown silty clay loam that has brown mottles
14 to 26 inches—dark yellowish brown clay loam that has grayish brown and strong brown mottles
26 to 38 inches—dark brown loam that has gray mottles
38 to 47 inches—strong brown clay loam that has gray mottles
47 to 60 inches—mottled gray, strong brown, and red clay loam

Substratum:
60 to 72 inches—mottled dark brown and gray loam

Important soil properties—

Permeability: Moderate
Available water capacity: High
Surface runoff: Slow
Hazard of water erosion: Slight
High water table: At a depth of 0.5 foot to 1.5 feet from November through April

Included with this unit in mapping are a few areas of Chastain, Bibb, Wehadkee, and Riverview soils. The poorly drained Chastain, Bibb, and Wehadkee soils are in depressions and the slightly lower areas. Chastain soils have a clayey subsoil, and Bibb soils have a sandy substratum. The well drained Riverview soils are in the slightly higher areas. Dissimilar inclusions make up about 20 percent of this map unit.

Most of this map unit is used as woodland. The rest is mainly used as cropland or pasture.

In cultivated areas of this Chewacla soil, the major crops are corn and soybeans. The hazard of flooding and the high water table are the main limitations affecting cropland. Cultivation may be delayed during wet periods. Artificial drainage systems may be needed to remove excess water. Planting winter cover crops, managing crop residue, and conservation tillage help to maintain tilth and conserve moisture.

In wooded areas, this soil is managed primarily for loblolly pine. The hazard of flooding, the high water table, competition from undesirable plant species, and a hazard of windthrow are the main limitations affecting woodland. The use of equipment may be restricted to periods when the soil is dry. Artificial drainage systems may be needed to remove excess water. Intensive site preparation, such as bedding and

applying herbicides, can help to establish seedlings, reduce the seedling mortality rate, and reduce the competition from undesirable plant species. Thinning stands carefully, avoiding damage to surficial root systems, and periodically removing windthrown trees may be needed. Based on a 50-year site curve, the mean site index for yellow-poplar is 96 feet.

The hazard of flooding and the high water table are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Because of the hazard of occasional flooding, sites for dwellings and septic tank absorption fields should be selected on more suitable soils.

The land capability subclass is IIIw. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 7W.

CwA—Chewacla and Wehadkee soils, 0 to 1 percent slopes, frequently flooded. These nearly level, very deep, somewhat poorly drained and poorly drained soils are on flood plains along the major rivers of the Coastal Plain and occur throughout the Piedmont. Because these soils react similarly to most kinds of use and management, they were not separated in mapping. Typically, this map unit is about 40 percent Chewacla soil, 35 percent Wehadkee soil, and 25 percent other soils. In some mapped areas Chewacla and Wehadkee soils both occur, and in others only one of the soils occurs. Individual areas are long and irregular in shape and range from about 25 to 200 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this Chewacla soil are as follows—

Surface layer:
0 to 4 inches—dark brown loam

Subsoil:
4 to 14 inches—dark yellowish brown silty clay loam that has brown mottles
14 to 26 inches—dark yellowish brown clay loam that has grayish brown and strong brown mottles
26 to 38 inches—dark brown loam that has gray mottles
38 to 47 inches—strong brown clay loam that has gray mottles
47 to 60 inches—mottled gray, strong brown, and red clay loam

Substratum:
60 to 72 inches—mottled dark brown and gray loam

Typically, the sequence, depth, color, and texture of the layers of this Wehadkee soil are as follows—

Surface layer:
0 to 3 inches—grayish brown loam that has strong brown and yellowish red mottles
3 to 7 inches—grayish brown silt loam that has dark yellowish brown, strong brown, and red mottles

Subsoil:
7 to 21 inches—light brownish gray silty clay loam that has dark yellowish brown and strong brown mottles
21 to 28 inches—gray clay loam that has strong brown and red mottles
28 to 33 inches—gray clay loam that has red mottles

Substratum:
33 to 44 inches—gray sandy clay loam that has yellowish brown mottles
44 to 50 inches—gray sandy loam
50 to 60 inches—gray sandy clay loam

Important soil properties of this Chewacla soil—

Permeability: Moderate
Available water capacity: High
Surface runoff: Slow
Hazard of water erosion: Slight
High water table: At a depth of 0.5 foot to 1.5 feet from November through April

Important soil properties of this Wehadkee soil—

Permeability: Moderate
Available water capacity: High
Surface runoff: Very slow
Hazard of water erosion: Slight
High water table: Within a depth of 1.0 foot from November through May

Included with this unit in mapping are a few areas of Riverview, Bibb, and Chastain soils. The well drained Riverview soils are on natural levees along the larger streams or in the slightly higher areas. The poorly drained Bibb and Chastain soils are intermingled with the Chewacla and Wehadkee soils in some areas. Chastain soils have a clayey subsoil, and Bibb soils have a sandy substratum. Dissimilar inclusions make up about 15 percent of this map unit.

Most of this map unit is used as woodland. The map unit is rarely used as cropland or pasture.

The hazard of flooding and the high water table are the main limitations affecting cropland in areas of these Chewacla and Wehadkee soils. A lack of suitable outlets may restrict the use of artificial drainage systems.

In wooded areas, these soils are primarily unmanaged. The hazard of flooding, the high water table, competition from undesirable plant species, and

a hazard of windthrow are the main limitations affecting woodland. The use of equipment may be restricted to periods when the soils are dry. The lack of suitable outlets may restrict the use of artificial drainage systems. Intensive site preparation, such as chopping, burning, and bedding, can help to establish seedlings, reduce the seedling mortality rate, and reduce the competition from undesirable plant species. Thinning stands carefully, avoiding damage to surficial root systems, and periodically removing windthrown trees may be needed. Based on a 50-year site curve, the mean site index for yellow-poplar is 96 feet in areas of the Chewacla soil and 100 feet in areas of the Wehadkee soil.

The hazard of flooding and the high water table are the main limitations affecting building site development and septic tank absorption fields in areas of these soils. Because of the hazard of frequent flooding, sites for dwellings and septic tank absorption fields should be selected on more suitable soils.

The land capability subclass is IVw in areas of the Chewacla soil and VIw in areas of the Wehadkee soil. Based on yellow-poplar as the indicator species, the woodland ordination symbol is 7W in areas of the Chewacla soil and 8W in areas of the Wehadkee soil.

DgA—Dogue silt loam, 0 to 3 percent slopes. This nearly level, very deep, moderately well drained soil is on broad, smooth flats, in depressions, and along drainageways on fluvial terraces along the Roanoke River and its major tributaries. Individual areas are irregular in shape and range from about 10 to 150 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 4 inches—dark grayish brown silt loam

Subsurface layer:
4 to 8 inches—light yellowish brown loam

Subsoil:
8 to 13 inches—yellow loam
13 to 17 inches—brownish yellow clay loam that has strong brown mottles
17 to 31 inches—brownish yellow clay that has strong brown and light gray mottles
31 to 40 inches—mottled brownish yellow, strong brown, and light gray clay
40 to 53 inches—mottled strong brown and light gray sandy clay loam that has pockets of sandy clay

Substratum:
53 to 62 inches—mottled yellow, brownish yellow, strong brown, and light gray sandy clay loam

Important soil properties—

Permeability: Moderately slow
Available water capacity: Moderate
Surface runoff: Slow
Hazard of water erosion: Slight
High water table: At a depth of 1.5 to 3.0 feet from January through March

Included with this unit in mapping are a few areas of Wahee, Roanoke, and Altavista soils. The somewhat poorly drained Wahee soils and the poorly drained Roanoke soils are in the slightly lower areas. Altavista soils have a loamy subsoil. They are intermingled with the Dogue soil in some areas. Dissimilar inclusions make up about 10 percent of this map unit.

Most of this map unit is used as woodland. The rest is mainly used as cropland or pasture.

In cultivated areas of this Dogue soil, the major crops are soybeans, cotton, corn, and small grain. The high water table and the moderately slow permeability in the subsoil are the main limitations affecting cropland. Cultivation may be delayed during wet periods. Artificial drainage systems may be needed to remove excess water, but the permeability can restrict the use of many drainage systems. Planting winter cover crops, managing crop residue, and conservation tillage help to maintain tilth and conserve moisture. In areas where slopes are 3 percent, conservation practices, such as no-till planting, stripcropping, crop rotations, contour farming, field borders, grassed waterways, and terraces and diversions, can also help to conserve water and control erosion.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species is the main limitation affecting use and management. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 90 feet.

The high water table, the moderately slow permeability in the subsoil, and a moderate shrink-swell potential are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing a drainage system around the septic tank absorption field may be needed to minimize problems caused by wetness and prevent the contamination of ground water. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. Placing extra reinforcement

in footings and foundations and backfilling with sandy material can minimize the damage caused by the shrinking and swelling of clay. A specially designed septic system may be needed.

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

DoA—Dothan loamy sand, 0 to 2 percent slopes. This nearly level, very deep, well drained soil is on broad, smooth, upland ridges in the Fall Line region of the upper Coastal Plain. Individual areas are irregular in shape and range from about 15 to 250 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 9 inches—brown loamy sand

Subsurface layer:
9 to 17 inches—yellowish brown loamy sand

Subsoil:
17 to 37 inches—yellowish brown sandy clay loam that has yellowish red mottles and few plinthite nodules
37 to 45 inches—yellowish brown sandy clay that has yellowish red mottles and common plinthite nodules
45 to 61 inches—red sandy clay that has yellowish red mottles and common plinthite nodules
61 to 72 inches—reticulately mottled pinkish gray, red, and yellowish red sandy loam that has pockets of sandy clay loam

Important soil properties—

Permeability: Moderate in the upper part of the subsoil and moderately slow in the lower part
Available water capacity: Moderate
Surface runoff: Slow
Hazard of water erosion: Slight
High water table: At a depth of 3.0 to 5.0 feet from January through April

Included with this unit in mapping are a few areas of Goldsboro and Fuquay soils. The moderately well drained Goldsboro soils have less than 5 percent plinthite, by volume, in the subsoil. They are on flats, in depressions, and along drainageways. Fuquay soils have a sandy surface layer that is more than 20 inches thick. They are intermingled with the Dothan soil in some areas. Also included are small areas of soils that have major properties, use, and management similar to those of the Dothan soil. These soils have less than 5 percent plinthite, by volume, in the subsoil or have few or common ironstone concretions on the surface and in the upper part of the subsoil. Dissimilar inclusions make up about 10 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as woodland or pasture.

In cultivated areas of this Dothan soil, the major crops are peanuts, cotton, corn, soybeans, tobacco, and small grain (fig. 5). A water table that is perched above the plinthic zone during wet periods, the droughtiness of the thick, sandy surface layer, and a hazard of soil blowing are the main limitations affecting cropland. Cultivation may be delayed during wet periods, and irrigation may be needed during dry periods. Blowing sand may damage young plants. Planting winter cover crops, managing crop residue, conservation tillage, establishing windbreaks, and including close-growing grasses and legumes in the cropping system help to control soil blowing, maintain tilth, and conserve moisture.

In wooded areas, this soil is managed primarily for loblolly pine. The droughtiness of the thick, sandy surface layer and competition from undesirable plant species are the main limitations affecting woodland. Seedling mortality is a hazard during dry periods. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 88 feet.

The perched water table and the moderately slow permeability in the lower part of the subsoil are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing a drainage system around the septic tank absorption field may be needed to minimize problems caused by wetness and prevent the contamination of ground water. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. A specially designed septic system may be needed.

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

DoB—Dothan loamy sand, 2 to 6 percent slopes. This gently sloping, very deep, well drained soil is on upland ridges in the Fall Line region of the upper Coastal Plain. Individual areas are irregular in shape and range from about 15 to 250 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Figure 5.—An area of Dothan loamy sand, 0 to 2 percent slopes. This soil is well suited to peanuts.

Surface layer:
0 to 9 inches—brown loamy sand

Subsurface layer:
9 to 17 inches—yellowish brown loamy sand

Subsoil:
17 to 37 inches—yellowish brown sandy clay loam that has yellowish red mottles and few plinthite nodules
37 to 45 inches—yellowish brown sandy clay that has yellowish red mottles and common plinthite nodules
45 to 61 inches—red sandy clay that has yellowish red mottles and common plinthite nodules
61 to 72 inches—reticulately mottled pinkish gray, red, and yellowish red sandy loam that has pockets of sandy clay loam

Important soil properties—

Permeability: Moderate in the upper part of the subsoil and moderately slow in the lower part
Available water capacity: Moderate
Surface runoff: Medium
Hazard of water erosion: Moderate
High water table: At a depth of 3.0 to 5.0 feet from January through April

Included with this unit in mapping are a few areas of Nankin and Fuquay soils. Nankin soils have less than 5 percent plinthite, by volume, in the subsoil; have common or many ironstone concretions in and on the surface layer and in the upper part of the subsoil; have a clayey subsoil; and are on the slightly higher knobs. Fuquay soils have a sandy surface layer that is more

than 20 inches thick. They are intermingled with the Dothan soil in some areas. Also included are small areas of soils that have major properties, use, and management similar to those of the Dothan soil. These soils have less than 5 percent plinthite, by volume, in the subsoil; have a thinner subsoil; or have few or common ironstone concretions on the surface and in the upper part of the subsoil. Dissimilar inclusions make up about 15 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as woodland or pasture.

In cultivated areas of this Dothan soil, the major crops are peanuts, cotton, corn, soybeans, tobacco, and small grain. The hazard of water erosion, a water table that is perched above the plinthic zone during wet periods, the droughtiness of the thick, sandy surface layer, and a hazard of soil blowing are the main limitations affecting cropland. Cultivation may be delayed during wet periods, and irrigation may be needed during dry periods. Blowing sand may damage young plants. Planting winter cover crops, managing crop residue, conservation tillage, establishing windbreaks, and including close-growing grasses and legumes in the cropping system help to control runoff, water erosion, and soil blowing, maintain tilth, and conserve moisture. Conservation practices, such as no-till planting, stripcropping, crop rotations, contour farming, field borders, grassed waterways, and terraces and diversions, can also help to conserve water and control erosion.

In wooded areas, this soil is managed primarily for loblolly pine. The droughtiness of the thick, sandy surface layer and competition from undesirable plant species are the main limitations affecting woodland. Seedling mortality is a concern during dry periods. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 88 feet.

The perched water table and the moderately slow permeability in the lower part of the subsoil are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing diversions that intercept runoff from the higher areas can also minimize problems caused by wetness that affect septic tank absorption fields. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. A specially designed septic system may be needed.

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

EmA—Emporia fine sandy loam, 0 to 2 percent slopes. This nearly level, very deep, well drained soil is on broad, smooth, upland ridges of the upper Coastal Plain. Individual areas are irregular in shape and range from about 10 to 150 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 10 inches—brown fine sandy loam

Subsurface layer:
10 to 17 inches—yellowish brown fine sandy loam

Subsoil:
17 to 43 inches—yellowish brown sandy clay loam
43 to 58 inches—yellowish brown clay that has gray, red, and brownish yellow mottles

Substratum:
58 to 67 inches—mottled yellowish brown, gray, strong brown, and red clay loam that has thin strata of sandy loam

Important soil properties—

Permeability: Moderately slow or moderate in the upper part of the subsoil and slow or moderately slow in the lower part
Available water capacity: Moderate
Surface runoff: Slow
Hazard of water erosion: Slight
High water table: At a depth of 3.0 to 4.5 feet from November through April

Included with this unit in mapping are a few areas of Goldsboro and Bonneau soils. The moderately well drained Goldsboro soils are on flats, in depressions, and along drainageways. Bonneau soils have a sandy surface layer that is more than 20 inches thick. They are intermingled with the Emporia soil in some areas. Also included are small areas of soils that have major properties, use, and management similar to those of the Emporia soil but have a thicker subsoil. Dissimilar inclusions make up about 10 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as woodland or pasture.

In cultivated areas of this Emporia soil, the major crops are peanuts, cotton, corn, tobacco, and soybeans. A water table that is perched during wet periods is the main limitation affecting cropland. Cultivation may be delayed during wet periods. Planting winter cover crops, managing crop residue,

and conservation tillage help to maintain tilth and conserve moisture.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species is the main limitation affecting use and management. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 75 feet.

The perched water table, the slow or moderately slow permeability in the lower part of the subsoil, and a moderate shrink-swell potential are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing a drainage system around the septic tank absorption field may be needed to minimize problems caused by wetness and prevent the contamination of ground water. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. Placing extra reinforcement in footings and foundations and backfilling with sandy material can minimize the damage caused by the shrinking and swelling of clay. A specially designed septic system may be needed.

The land capability class is I. Based on loblolly pine as the indicator species, the woodland ordination symbol is 7A.

EmB—Emporia fine sandy loam, 2 to 6 percent slopes. This gently sloping, very deep, well drained soil is on upland ridges and side slopes of the Coastal Plain. Individual areas are irregular in shape and range from about 5 to 100 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 10 inches—brown fine sandy loam

Subsurface layer:
10 to 17 inches—yellowish brown fine sandy loam

Subsoil:
17 to 43 inches—yellowish brown sandy clay loam
43 to 58 inches—yellowish brown clay that has gray, red, and brownish yellow mottles

Substratum:
58 to 67 inches—mottled yellowish brown, gray, strong brown, and red clay loam that has thin strata of sandy loam

Important soil properties—

Permeability: Moderately slow or moderate in the upper part of the subsoil and slow or moderately slow in the lower part
Available water capacity: Moderate
Surface runoff: Medium
Hazard of water erosion: Moderate
High water table: At a depth of 3.0 to 4.5 feet from November through April

Included with this unit in mapping are a few areas of Gritney, Marlboro, and Bonneau soils. The moderately well drained Gritney soils have a clayey subsoil. They are on shoulders and side slopes. Marlboro soils have a clayey subsoil. Marlboro and Bonneau soils are intermingled with the Emporia soil in some areas. Bonneau soils have a sandy surface layer that is more than 20 inches thick. In some areas eroded soils that have a surface layer of sandy clay loam are intermingled with the Emporia soil. Also included are small areas of soils that have major properties, use, and management similar to those of the Emporia soil but have a thicker subsoil. Dissimilar inclusions make up about 12 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as pasture or woodland.

In cultivated areas of this Emporia soil, the major crops are cotton, tobacco, peanuts, corn, and soybeans. The hazard of erosion and a water table that is perched during wet periods are the main limitations affecting cropland. Cultivation may be delayed during wet periods. Planting winter cover crops and managing crop residue help to control runoff and erosion and maintain tilth. Conservation practices, such as no-till planting, stripcropping, crop rotations, contour farming, field borders, grassed waterways, and terraces and diversions, can also help to conserve water and control erosion.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species is the main limitation affecting use and management. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 75 feet.

The perched water table, the slow or moderately slow permeability in the lower part of the subsoil, and a moderate shrink-swell potential are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from

dwellings can minimize problems caused by wetness. Installing diversions that intercept runoff from the higher areas can also minimize problems caused by wetness that affect septic tank absorption fields. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. Placing extra reinforcement in footings and foundations and backfilling with sandy material can minimize the damage caused by the shrinking and swelling of clay. A specially designed septic system may be needed.

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

EmC—Emporia fine sandy loam, 6 to 10 percent slopes. This moderately sloping, very deep, well drained soil is on upland side slopes of the Coastal Plain. Individual areas are irregular in shape and range from about 10 to 75 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 10 inches—brown fine sandy loam

Subsurface layer:
10 to 17 inches—yellowish brown fine sandy loam

Subsoil:
17 to 43 inches—yellowish brown sandy clay loam
43 to 58 inches—yellowish brown clay that has gray, red, and brownish yellow mottles

Substratum:
58 to 67 inches—mottled yellowish brown, gray, strong brown, and red clay loam that has thin strata of sandy loam

Important soil properties—

Permeability: Moderately slow or moderate in the upper part of the subsoil and slow or moderately slow in the lower part
Available water capacity: Moderate
Surface runoff: Rapid
Hazard of water erosion: Severe
High water table: At a depth of 3.0 to 4.5 feet from November through April

Included with this unit in mapping are a few areas of Gritney, Winton, and Bonneau soils. The moderately well drained Gritney soils have a clayey subsoil and are on shoulders. The moderately well drained Winton soils are in the steeper areas. Bonneau soils have a sandy surface layer that is more than 20 inches thick. They are intermingled with the Emporia soil in some areas. In some areas eroded soils having a surface layer of sandy clay loam are intermingled with the Emporia soil. Dissimilar inclusions make up about 15 percent of this map unit.

Most of this map unit is used as woodland. The rest is mainly used as cropland or pasture.

In cultivated areas of this Emporia soil, the major crops are peanuts, tobacco, cotton, and corn. The slope, the hazard of erosion, and a water table that is perched during wet periods are the main limitations affecting cropland. Planting winter cover crops and managing crop residue help to control runoff and erosion and maintain tilth. Conservation practices, such as no-till planting, stripcropping, crop rotations, contour farming, field borders, grassed waterways, and terraces and diversions, can also help to conserve water and control erosion.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species is the main limitation affecting use and management. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 75 feet.

The perched water table, the slow or moderately slow permeability in the lower part of the subsoil, the slope, and a moderate shrink-swell potential are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing diversions that intercept runoff from the higher areas can also minimize problems caused by wetness that affect septic tank absorption fields. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. Designing dwellings so that they conform to the natural slope and land shaping can help to overcome the slope limitation. Placing extra reinforcement in footings and foundations and backfilling with sandy material can minimize the damage caused by the shrinking and swelling of clay. A specially designed septic system may be needed.

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

ErB—Emporia-Urban land complex, 0 to 6 percent slopes. This map unit consists of areas of Emporia soil and Urban land that are too small and too intermingled to be mapped separately at the selected

scale. Typically, this map unit is about 40 percent Emporia soil, 30 percent Urban land, and 30 percent other soils. It occurs most extensively in and around Roanoke Rapids but also occurs in Enfield. Individual areas are irregular in shape and range from about 15 to 300 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this Emporia soil are as follows—

Surface layer:
0 to 10 inches—brown fine sandy loam

Subsurface layer:
10 to 17 inches—yellowish brown fine sandy loam

Subsoil:
17 to 43 inches—yellowish brown sandy clay loam
43 to 58 inches—yellowish brown clay that has gray, red, and brownish yellow mottles

Substratum:
58 to 67 inches—mottled yellowish brown, gray, strong brown, and red clay loam that has thin strata of sandy loam

Important soil properties of this Emporia soil—

Permeability: Moderately slow or moderate in the upper part of the subsoil and slow or moderately slow in the lower part
Available water capacity: Moderate
Surface runoff: Medium
Hazard of water erosion: Moderate
High water table: At a depth of 3.0 to 4.5 feet from November through April

Urban land consists of areas where the original soil has been covered by concrete, asphalt, buildings, or other impervious surfaces. Slopes are modified for the land use and commonly range from about 0 to 3 percent.

Included with this unit in mapping are a few areas of Goldsboro, Lynchburg, Rains, Turbeville, Marlboro, Bonneau, Wehadkee, Chastain, Bibb, and Chewacla soils. The moderately well drained Goldsboro, somewhat poorly drained Lynchburg, and poorly drained Rains soils are on flats, in depressions, and along drainageways. Turbeville and Marlboro soils have a clayey subsoil. Turbeville, Marlboro, and Bonneau soils are intermingled with the Emporia soil in some areas. Bonneau soils have a sandy surface layer that is more than 20 inches thick. The poorly drained Wehadkee, Chastain, and Bibb soils and the somewhat poorly drained Chewacla soils are on flood plains. Dissimilar inclusions make up about 15 percent of this map unit.

This map unit is used as urban land. It is not used as cropland or woodland.

The perched water table, the slow or moderately slow permeability in the lower part of the subsoil, and a moderate shrink-swell potential are the main limitations affecting building site development and septic tank absorption fields in areas of the Emporia soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing diversions that intercept runoff from the higher areas can also minimize problems caused by wetness that affect septic tank absorption fields. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. Placing extra reinforcement in footings and foundations and backfilling with sandy material can minimize the damage caused by the shrinking and swelling of clay. A specially designed septic system may be needed.

This map unit is not assigned a land capability subclass or a woodland ordination symbol.

EwB—Emporia-Wedowee complex, 2 to 6 percent slopes. This map unit consists of areas of Emporia and Wedowee soils that are too small and too intermingled to be mapped separately at the selected scale. These gently sloping, very deep, well drained soils are on upland ridges and side slopes in the Fall Line region of the upper Coastal Plain. Individual areas are irregular in shape and range from about 15 to 150 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this Emporia soil are as follows—

Surface layer:
0 to 10 inches—brown fine sandy loam

Subsurface layer:
10 to 17 inches—yellowish brown fine sandy loam

Subsoil:
17 to 43 inches—yellowish brown sandy clay loam
43 to 58 inches—yellowish brown clay that has gray, red, and brownish yellow mottles

Substratum:
58 to 67 inches—mottled yellowish brown, gray, strong brown, and red clay loam that has thin strata of sandy loam

Typically, the sequence, depth, color, and texture of the layers of this Wedowee soil are as follows—

Surface layer:
0 to 7 inches—dark brown sandy loam

Subsoil:
7 to 10 inches—yellowish brown sandy loam
10 to 19 inches—strong brown clay that has yellowish red mottles
19 to 26 inches—strong brown clay that has brownish yellow and red mottles
26 to 36 inches—strong brown clay loam that has brownish yellow, white, and red mottles

Substratum:
36 to 63 inches—mottled strong brown, brownish yellow, pink, white, and red saprolite of sandy clay loam

Important soil properties of this Emporia soil—

Permeability: Moderately slow or moderate in the upper part of the subsoil and slow or moderately slow in the lower part
Available water capacity: Moderate
Surface runoff: Medium
Hazard of water erosion: Moderate
High water table: At a depth of 3.0 to 4.5 feet from November through April

Important soil properties of this Wedowee soil—

Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Medium
Hazard of water erosion: Moderate
Depth to high water table: More than 6.0 feet

Included with this unit in mapping are a few areas of Goldsboro and Bonneau soils. The moderately well drained Goldsboro soils have a loamy subsoil and are on flats, in depressions, and along drainageways. Bonneau soils have a loamy subsoil and a sandy surface layer that is more than 20 inches thick. They are intermingled with the Emporia and Wedowee soils in some areas. In some areas soils that have a cobbly or gravelly surface layer or eroded soils that have a surface layer of sandy clay loam are intermingled with the Emporia and Wedowee soils. Also included are small areas of soils that have major properties, use, and management similar to those of the Emporia and Wedowee soils. These soils have more than 5 percent ironstone concretions or plinthite, by volume, in the subsoil. Dissimilar inclusions make up about 20 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as pasture or woodland.

In cultivated areas of these Emporia and Wedowee soils, the major crops are cotton, tobacco, peanuts, corn, and soybeans. The hazard of erosion and a water table that is perched in the Emporia soil during wet periods are the main limitations affecting cropland. Cultivation may be delayed during wet periods. Planting winter cover crops and managing crop residue help to control runoff and erosion and maintain tilth. Conservation practices, such as no-till planting, stripcropping, crop rotations, contour farming, field borders, grassed waterways, and terraces and diversions, can also help to conserve water and control erosion.

In wooded areas, these soils are managed primarily for loblolly pine. Competition from undesirable plant species is the main limitation affecting use and management. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 75 feet in areas of the Emporia soil and 87 feet in areas of the Wedowee soil.

The perched water table, the permeability in the subsoil, and a moderate shrink-swell potential in the Emporia soil are the main limitations affecting building site development and septic tank absorption fields in areas of this map unit. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing diversions that intercept runoff from the higher areas can also minimize problems caused by wetness that affect septic tank absorption fields. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. Placing extra reinforcement in footings and foundations and backfilling with sandy material can minimize the damage caused by the shrinking and swelling of clay. A specially designed septic system may be needed.

The land capability subclass is IIe. Based on loblolly pine as the indicator species, the woodland ordination symbol is 7A in areas of the Emporia soil and 9A in areas of the Wedowee soil.

ExA—Exum silt loam, 0 to 2 percent slopes. This nearly level, very deep, moderately well drained soil is on broad, smooth, upland flats, in depressions, and along drainageways of the Coastal Plain. Individual areas are irregular in shape and range from about 10 to 150 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 9 inches—gray silt loam

Subsurface layer:
9 to 15 inches—light yellowish brown silt loam

Subsoil:
15 to 25 inches—yellowish brown silt loam
25 to 33 inches—yellowish brown loam that has light brownish gray mottles
33 to 62 inches—yellowish brown loam that has light brownish gray and strong brown mottles

Important soil properties—

Permeability: Moderately slow
Available water capacity: High
Surface runoff: Slow
Hazard of water erosion: Slight
High water table: At a depth of 2.0 to 3.0 feet from December through April

Included with this unit in mapping are a few areas of Nahunta, Grantham, and Aycock soils. The somewhat poorly drained Nahunta soils and the poorly drained Grantham soils are in the slightly lower areas. The well drained Aycock soils are in the slightly higher areas. Also included are small areas of soils that have major properties, use, and management similar to those of the Exum soil but have a surface layer of fine sandy loam. Dissimilar inclusions make up about 17 percent of this map unit.

Most of this map unit is used as woodland. The rest is mainly used as cropland or pasture.

In cultivated areas of this Exum soil, the major crops are peanuts, cotton, corn, and soybeans. The high water table is the main limitation affecting cropland. Artificial drainage systems may be needed to remove excess water. Planting winter cover crops, managing crop residue, and conservation tillage help to maintain tilth and conserve moisture.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species is the main limitation affecting woodland. Intensive site preparation, such as chopping, burning, and applying herbicides, can help to establish seedlings, reduce the seedling mortality rate, and reduce the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 82 feet.

The high water table and the moderately slow permeability in the subsoil are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing a drainage system around the septic tank absorption field may be needed to minimize problems caused by wetness and prevent the contamination of ground water. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. A specially designed septic system may be needed.

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

FuB—Fuquay sand, 0 to 4 percent slopes. This nearly level and gently sloping, very deep, well drained soil is on broad, smooth, upland ridges in the Fall Line region of the upper Coastal Plain. Individual areas are irregular in shape and range from about 10 to 100 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 9 inches—brown sand

Subsurface layer:
9 to 25 inches—light yellowish brown loamy sand

Subsoil:
25 to 36 inches—yellowish brown sandy loam that has strong brown mottles
36 to 42 inches—light yellowish brown sandy loam that has very pale brown mottles
42 to 51 inches—yellowish brown sandy clay loam that has light brownish gray and red mottles and common plinthite nodules
51 to 62 inches—reticulately mottled red, light brownish gray, and strong brown sandy clay loam that has pockets of sandy clay and common plinthite nodules
62 to 70 inches—reticulately mottled red, light brownish gray, and strong brown sandy loam that has pockets of clay loam and common plinthite nodules

Important soil properties—

Permeability: Moderate in the upper part of the subsoil and slow in the lower part
Available water capacity: Low
Surface runoff: Slow
Hazard of water erosion: Slight
High water table: At a depth of 4.0 to 6.0 feet from January through March

Included with this unit in mapping are a few areas of Emporia and Dothan soils. Emporia soils have less than 5 percent plinthite, by volume, in the subsoil and have a subsoil that is thinner than that of the Fuquay soil. Emporia and Dothan soils are intermingled with

the Fuquay soil in some areas. Dothan soils have a sandy surface layer that is less than 20 inches thick. Also included are small areas of soils that have major properties, use, and management similar to those of the Fuquay soil. These soils have less than 5 percent plinthite, by volume, in the subsoil. Dissimilar inclusions make up about 10 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as woodland or pasture.

In cultivated areas of this Fuquay soil, the major crops are peanuts, cotton, soybeans, and tobacco. The droughtiness of the thick, sandy surface layer, a hazard of soil blowing, the low available water capacity, and the leaching of plant nutrients are the main limitations affecting cropland. Irrigation may be needed during dry periods. Blowing sand may damage young plants. Planting winter cover crops, managing crop residue, conservation tillage, establishing windbreaks, and including close-growing grasses and legumes in the cropping system help to control soil blowing, maintain tilth, and conserve moisture. Fertilizers, particularly nitrogen, should be used in split applications.

In wooded areas, this soil is managed primarily for loblolly pine. The droughtiness of the thick, sandy surface layer is the main limitation affecting use and management. Seedling mortality is a hazard during dry periods. When dry, the sandy layers are soft and may limit the use of equipment. Based on a 50-year site curve, the mean site index for loblolly pine is 80 feet.

The perched water table and the slow permeability in the lower part of the subsoil are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing diversions that intercept runoff from the higher areas can also minimize problems caused by wetness that affect septic tank absorption fields. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. A specially designed septic system may be needed.

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

GoA—Goldsboro fine sandy loam, 0 to 2 percent slopes. This nearly level, very deep, moderately well drained soil is on broad, smooth, upland flats, in depressions, and along drainageways of the Coastal Plain. Individual areas are irregular in shape and range from about 10 to 100 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 7 inches—brown fine sandy loam

Subsoil:
7 to 18 inches—brownish yellow sandy clay loam
18 to 25 inches—yellowish brown sandy clay loam that has strong brown mottles
25 to 35 inches—yellowish brown sandy clay loam that has gray and strong brown mottles
35 to 52 inches—mottled yellowish brown, gray, and strong brown sandy clay loam
52 to 72 inches—mottled yellowish brown, gray, strong brown, and red sandy clay loam

Important soil properties—

Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Slow
Hazard of water erosion: Slight
High water table: At a depth of 2.0 to 2.5 feet from December through April

Included with this unit in mapping are a few areas of Emporia, Noboco, Lynchburg, and Rains soils. The well drained Emporia and Noboco soils are in the slightly higher areas. The somewhat poorly drained Lynchburg soils and the poorly drained Rains soils are in the slightly lower areas. Also included are soils having a clayey subsoil that are intermingled with the Goldsboro soil in some areas. Dissimilar inclusions make up about 10 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as woodland or pasture.

In cultivated areas of this Goldsboro soil, the major crops are peanuts, cotton, soybeans, and corn. The high water table is the main limitation affecting cropland. Cultivation may be delayed during wet periods. Artificial drainage systems may be needed to remove excess water. Planting winter cover crops, managing crop residue, and conservation tillage help to maintain tilth and conserve moisture.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species is the main limitation affecting use and management. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 88 feet.

The high water table is the main limitation affecting

building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing a drainage system around the septic tank absorption field may be needed to minimize problems caused by wetness and prevent the contamination of ground water. A specially designed septic system may be needed.

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

GrA—Grantham loam, 0 to 1 percent slopes. This nearly level, very deep, poorly drained soil is on broad, smooth, upland flats, in depressions, and along drainageways of the Coastal Plain. Individual areas are irregular in shape and range from about 50 to 500 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 8 inches—very dark gray loam

Subsurface layer:
8 to 12 inches—light brownish gray loam that has yellow mottles

Subsoil:
12 to 17 inches—light brownish gray loam that has brownish yellow and strong brown mottles
17 to 21 inches—light gray loam that has brownish yellow and strong brown mottles
21 to 45 inches—light gray loam that has brownish yellow and strong brown mottles
45 to 60 inches—light brownish gray loam that has light gray, brownish yellow, and red mottles
60 to 75 inches—light brownish gray clay loam that has brownish yellow and strong brown mottles

Important soil properties—

Permeability: Moderately slow
Available water capacity: High
Surface runoff: Very slow
Hazard of water erosion: Slight
High water table: Within a depth of 1.0 foot from December through May

Included with this unit in mapping are a few areas of Exum, Nahunta, and Bethera soils. The moderately well drained Exum soils and the somewhat poorly drained Nahunta soils are in the slightly higher areas. Bethera soils have a clayey subsoil. They are intermingled with the Grantham soil in some areas. Also included are small areas of soils that have major properties, use, and management similar to those of the Grantham soil but are very poorly drained. Dissimilar inclusions make up about 13 percent of this map unit.

Most of this map unit is used as woodland. The rest is mainly used as cropland or pasture.

In drained and cultivated areas of this Grantham soil, the major crops are corn, soybeans, and small grain. The high water table and the moderately slow permeability in the subsoil are the main limitations affecting cropland. Cultivation may be delayed during wet periods. Artificial drainage systems may be needed to remove excess water, but a lack of suitable outlets and the permeability can restrict the use of many drainage systems.

In wooded areas, this soil is managed primarily for loblolly pine. The high water table, competition from undesirable plant species, and a hazard of windthrow are the main limitations affecting woodland. The use of equipment may be restricted to periods when the soil is dry. Artificial drainage systems may be needed to remove excess water, but the lack of suitable outlets can restrict the use of many drainage systems. Intensive site preparation, such as chopping, burning, and bedding, can help to establish seedlings, reduce the seedling mortality rate, and reduce the competition from undesirable plant species. Thinning stands carefully, avoiding damage to surficial root systems, and periodically removing windthrown trees may be needed. Based on a 50-year site curve, the mean site index for loblolly pine is 86 feet.

The high water table and the moderately slow permeability in the subsoil are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing a drainage system around the septic tank absorption field may be needed to minimize problems caused by wetness and prevent the contamination of ground water. The lack of suitable outlets may be a problem in some areas. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. A specially designed septic system may be needed.

The land capability subclass is IIIw in drained areas and VIw in undrained areas. Based on loblolly pine as the indicator species, the woodland ordination symbol is 9W.

GtB—Gritney fine sandy loam, 2 to 6 percent slopes. This gently sloping, very deep, moderately well drained soil is on upland ridges and side slopes of the Coastal Plain. Individual areas are irregular in shape and range from about 25 to 350 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 6 inches—yellowish brown fine sandy loam

Subsoil:
6 to 14 inches—yellowish brown sandy clay loam
14 to 27 inches—yellowish brown clay that has yellowish red mottles
27 to 42 inches—mottled yellowish brown, light gray, red, brownish yellow, and dark yellowish brown clay
42 to 57 inches—mottled yellowish brown, light gray, red, brownish yellow, and dark yellowish brown clay that has pockets of sandy clay loam

Substratum:
57 to 60 inches—mottled yellowish brown, light gray, red, brownish yellow, and dark yellowish brown clay loam

Important soil properties—

Permeability: Slow
Available water capacity: Moderate
Surface runoff: Medium
Hazard of water erosion: Severe
High water table: At a depth of 1.5 to 3.0 feet from December through April

Included with this unit in mapping are a few areas of Emporia, Noboco, Marlboro, and Goldsboro soils. The well drained Emporia and Noboco soils have a loamy subsoil and are in the slightly higher and smoother areas. Noboco and Marlboro soils have a subsoil that is thicker than that of the Gritney soil. The well drained Marlboro soils are in the slightly smoother areas. Goldsboro soils have a loamy subsoil and are on flats, in depressions, and along drainageways. In some areas eroded soils having a surface layer of sandy clay loam are intermingled with the Gritney soil. Also included are small areas of soils that have major properties, use, and management similar to those of the Gritney soil but have more silt in the subsoil. Dissimilar inclusions make up about 20 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as woodland or pasture.

In cultivated areas of this Gritney soil, the major crops are corn, soybeans, cotton, tobacco, and peanuts. The hazard of erosion, a water table that is perched during wet periods, and the slow permeability in the subsoil are the main limitations affecting cropland. Cultivation may be delayed during wet periods. Planting winter cover crops and managing crop residue help to control runoff and erosion and maintain tilth. Conservation practices, such as no-till planting, stripcropping, crop rotations, contour farming, field borders, grassed waterways, and terraces and diversions, can also help to conserve water and control erosion.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species is the main limitation affecting use and management. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 84 feet.

The perched water table, the slow permeability in the subsoil, and the moderate shrink-swell potential are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing diversions that intercept runoff from the higher areas can also minimize problems caused by wetness that affect septic tank absorption fields. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. Placing extra reinforcement in footings and foundations and backfilling with sandy material can minimize the damage caused by the shrinking and swelling of clay. A specially designed septic system may be needed.

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

GtC—Gritney fine sandy loam, 6 to 10 percent slopes. This moderately sloping, very deep, moderately well drained soil is on side slopes of the Coastal Plain. Individual areas are irregular in shape and range from about 25 to 50 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 6 inches—yellowish brown fine sandy loam

Subsoil:
6 to 14 inches—yellowish brown sandy clay loam
14 to 27 inches—yellowish brown clay that has yellowish red mottles

27 to 42 inches—mottled yellowish brown, light gray, red, brownish yellow, and dark yellowish brown clay
42 to 57 inches—mottled yellowish brown, light gray, red, brownish yellow, and dark yellowish brown clay that has pockets of sandy clay loam

Substratum:
57 to 60 inches—mottled yellowish brown, light gray, red, brownish yellow, and dark yellowish brown clay loam

Important soil properties—

Permeability: Slow
Available water capacity: Moderate
Surface runoff: Rapid
Hazard of water erosion: Severe
High water table: At a depth of 1.5 to 3.0 feet from December through April

Included with this unit in mapping are a few areas of Emporia soils. These well drained soils have a loamy subsoil. They are in the smoother areas. In some areas eroded soils having a surface layer of sandy clay loam are intermingled with the Gritney soil. Also included are small areas of soils that have major properties, use, and management similar to those of the Gritney soil but have more silt in the subsoil. Dissimilar inclusions make up about 10 percent of this map unit.

Most of this map unit is used as woodland. The rest is mainly used as cropland or pasture.

In cultivated areas of this Gritney soil, the major crops are corn, soybeans, cotton, and tobacco. The slope, the hazard of erosion, a water table that is perched during wet periods, and the slow permeability in the subsoil are the main limitations affecting cropland. Cultivation may be delayed during wet periods. Planting winter cover crops and managing crop residue help to control runoff and erosion and maintain tilth. Conservation practices, such as no-till planting, stripcropping, crop rotations, contour farming, field borders, grassed waterways, and terraces and diversions, can also help to conserve water and control erosion.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species is the main limitation affecting use and management. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 84 feet.

The perched water table, the slow permeability in the subsoil, the slope, and a moderate shrink-swell potential are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing diversions that intercept runoff from the higher areas can also minimize problems caused by wetness that affect septic tank absorption fields. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. Designing dwellings so that they conform to the natural slope and land shaping can help to overcome the slope limitation. Placing extra reinforcement in footings and foundations and backfilling with sandy material can minimize the damage caused by the shrinking and swelling of clay. A specially designed septic system may be 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, very deep, moderately well drained soil is on upland ridges and side slopes of the Coastal Plain. Individual areas are irregular in shape and range from about 10 to 50 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 4 inches—yellowish brown sandy clay loam that has red mottles

Subsoil:
4 to 15 inches—yellowish brown clay that has red mottles
15 to 26 inches—mottled yellowish brown, red, and light gray clay
26 to 38 inches—mottled yellowish brown, red, light gray, and dark red clay that has pockets of sandy clay loam

Substratum:
38 to 46 inches—mottled yellowish brown, red, light gray, and dark red sandy clay loam that has pockets of sandy clay
46 to 60 inches—mottled yellowish brown, red, light gray, and dark red sandy clay

Important soil properties—

Permeability: Slow
Available water capacity: Moderate
Surface runoff: Rapid

Hazard of water erosion: Severe
High water table: At a depth of 1.5 to 3.0 feet from December through April

Included with this unit in mapping are a few areas of Emporia soils. These well drained soils have a loamy subsoil. They are in the slightly higher and smoother areas. In some areas noneroded soils have a surface layer of sandy loam. Also included are small areas of soils that have major properties, use, and management similar to those of the Gritney soil but have more silt in the subsoil. Dissimilar inclusions make up about 10 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as woodland or pasture.

In cultivated areas of this Gritney soil, the major crops are corn, soybeans, cotton, tobacco, and peanuts. The hazard of erosion, a water table that is perched during wet periods, the slow permeability in the subsoil, and poor tilth are the main limitations affecting cropland. Cultivation may be delayed during wet periods. Planting winter cover crops and managing crop residue help to control runoff and erosion and maintain tilth. Conservation practices, such as no-till planting, stripcropping, crop rotations, contour farming, field borders, grassed waterways, and terraces and diversions, can also help to conserve water and control erosion.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species and the high content of clay in the upper 10 inches of the soil are the main limitations affecting woodland. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Unsurfaced roads may be impassable during wet periods because of the high content of clay in the upper 10 inches of the soil. Logging during the drier periods helps to prevent rutting of the surface layer and possible root damage from compaction. Based on a 50-year site curve, the mean site index for loblolly pine is 80 feet.

The perched water table, the slow permeability in the subsoil, and a moderate shrink-swell potential are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing diversions that intercept runoff from the higher areas can also minimize problems caused by wetness that affect septic tank absorption fields. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. Placing extra reinforcement in footings and foundations and backfilling with sandy material can minimize the damage caused by the shrinking and swelling of clay. A specially designed septic system may be needed.

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

HeA—Helena sandy loam, 0 to 3 percent slopes. This nearly level, very deep, moderately well drained soil is at the head of drainageways and along drainageways of the Piedmont. Individual areas are irregular in shape and range from about 10 to 50 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 4 inches—yellowish brown sandy loam

Subsurface layer:
4 to 8 inches—very pale brown sandy loam

Subsoil:
8 to 15 inches—brownish yellow sandy clay that has red mottles
15 to 20 inches—reddish yellow clay that has gray and red mottles
20 to 26 inches—mottled gray, reddish yellow, and red clay
26 to 37 inches—gray clay that has white and reddish yellow mottles
37 to 48 inches—mottled gray, white, and reddish yellow clay loam that has pockets of sandy clay loam

Substratum:
48 to 62 inches—mottled gray, white, and reddish yellow saprolite of sandy clay loam

Important soil properties—

Permeability: Slow
Available water capacity: Moderate
Surface runoff: Medium
Hazard of water erosion: Slight
High water table: At a depth of 1.5 to 2.5 feet from January through April

Included with this unit in mapping are a few areas of Chewacla and Wehadkee soils. The somewhat poorly drained Chewacla soils and the poorly drained Wehadkee soils have a loamy subsoil. They are on

flood plains. Also included are soils having a loamy subsoil that are intermingled with the Helena soil in some areas. Dissimilar inclusions make up about 5 percent of this map unit.

Most of this map unit is used as woodland. The rest is mainly used as cropland or pasture.

In cultivated areas of this Helena soil, the major crops are tobacco, soybeans, and corn. A water table that is perched during wet periods and the slow permeability in the subsoil are the main limitations affecting cropland. Cultivation may be delayed during wet periods. Planting winter cover crops, managing crop residue, and conservation tillage help to maintain tilth and conserve moisture. In areas where slopes are 3 percent, conservation practices, such as no-till planting, stripcropping, crop rotations, contour farming, field borders, grassed waterways, and terraces and diversions, can also help to conserve water and control erosion.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species and the high content of clay in the upper 10 inches of the soil are the main limitations affecting woodland. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Unsurfaced roads may be impassable during wet periods because of the high content of clay in the upper 10 inches of the soil. Logging during the drier periods helps to prevent rutting of the surface layer and possible root damage from compaction. Based on a 50-year site curve, the mean site index for loblolly pine is 84 feet.

The perched water table, the slow permeability in the subsoil, and a high shrink-swell potential are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing diversions that intercept runoff from the higher areas can also minimize problems caused by wetness that affect septic tank absorption fields. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. Placing extra reinforcement in footings and foundations and backfilling with sandy material can minimize the damage caused by the shrinking and swelling of clay. A specially designed septic system may be needed.

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

HrB—Herndon silt loam, 2 to 6 percent slopes. This gently sloping, very deep, well drained soil is on upland ridges and side slopes of the Piedmont. Individual areas are irregular in shape and range from about 10 to 50 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 4 inches—dark grayish brown silt loam

Subsurface layer:
4 to 8 inches—light yellowish brown silt loam

Subsoil:
8 to 19 inches—strong brown silty clay
19 to 31 inches—strong brown silty clay that has red mottles
31 to 39 inches—yellowish red silty clay that has yellow mottles
39 to 45 inches—mottled strong brown, yellowish red, yellow, and red silty clay loam

Substratum:
45 to 61 inches—mottled light gray, yellow, pinkish white, and red saprolite of silt loam

Important soil properties—

Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Medium
Hazard of water erosion: Moderate
Depth to high water table: More than 6.0 feet

Included with this unit in mapping are a few areas of Lignum soils. These moderately well drained and somewhat poorly drained soils are on flats, at the head of drainageways, and along drainageways. In some areas eroded soils that have a surface layer of silty clay loam or soils that have soft weathered bedrock within a depth of 60 inches are intermingled with the Herndon soil. Also included are small areas of soils that have major properties, use, and management similar to those of the Herndon soil but have a red subsoil or a thinner subsoil. Dissimilar inclusions make up about 5 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as woodland or pasture.

In cultivated areas of this Herndon soil, the major crops are tobacco, corn, soybeans, and small grain. The hazard of erosion is the main limitation affecting cropland. Planting winter cover crops and managing crop residue help to control runoff and erosion and maintain tilth. Conservation practices, such as no-till planting, stripcropping, crop rotations, contour farming, field borders, grassed waterways, and terraces and

diversions, can also help to conserve water and control erosion.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species and the high content of clay in the upper 10 inches of the soil are the main limitations affecting woodland. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Unsurfaced roads may be impassable during wet periods because of the high content of clay in the upper 10 inches of the soil. Logging during the drier periods helps to prevent rutting of the surface layer and possible root damage from compaction. Based on a 50-year site curve, the mean site index for loblolly pine is 81 feet.

The moderate permeability in the subsoil is the main limitation affecting building site development and septic tank absorption fields in areas of this soil. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. A specially designed septic system may be needed.

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

HrC—Herndon silt loam, 6 to 10 percent slopes. This moderately sloping, very deep, well drained soil is on side slopes of the Piedmont. Individual areas are irregular in shape and range from about 10 to 50 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 4 inches—dark grayish brown silt loam

Subsurface layer:
4 to 8 inches—light yellowish brown silt loam

Subsoil:
8 to 19 inches—strong brown silty clay
19 to 31 inches—strong brown silty clay that has red mottles
31 to 39 inches—yellowish red silty clay that has yellow mottles
39 to 45 inches—mottled strong brown, yellowish red, yellow, and red silty clay loam

Substratum:
45 to 61 inches—mottled light gray, yellow, pinkish white, and red saprolite of silt loam

Important soil properties—

Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Rapid
Hazard of water erosion: Severe
Depth to high water table: More than 6.0 feet

Included with this unit in mapping are a few areas of Lignum soils. These moderately well drained and somewhat poorly drained soils are on flats, at the head of drainageways, and along drainageways. In some areas eroded soils that have a surface layer of silty clay loam or soils that have soft weathered bedrock within a depth of 60 inches are intermingled with the Herndon soil. Also included are small areas of soils that have major properties, use, and management similar to those of the Herndon soil but have a red subsoil or a thinner subsoil. Dissimilar inclusions make up about 5 percent of this map unit.

Most of this map unit is used as woodland. The rest is mainly used as cropland or pasture.

In cultivated areas of this Herndon soil, the major crops are tobacco, corn, soybeans, and small grain. The slope and the hazard of erosion are the main limitations affecting cropland. Planting winter cover crops and managing crop residue help to control runoff and erosion and maintain tilth. Conservation practices, such as no-till planting, stripcropping, crop rotations, contour farming, field borders, grassed waterways, and terraces and diversions, can also help to conserve water and control erosion.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species and the high content of clay in the upper 10 inches of the soil are the main limitations affecting woodland. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Unsurfaced roads may be impassable during wet periods because of the high content of clay in the upper 10 inches of the soil. Logging during the drier periods helps to prevent rutting of the surface layer and possible root damage from compaction. Based on a 50-year site curve, the mean site index for loblolly pine is 81 feet.

The moderate permeability in the subsoil and the slope are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. Designing dwellings so that they conform to the natural slope, land shaping, and installing the septic tank absorption lines on the contour can help to overcome the slope limitation. A specially designed septic system may be needed.

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

LgA—Lignum silt loam, 0 to 3 percent slopes. This nearly level, deep, moderately well drained and somewhat poorly drained soil is on broad, smooth, upland flats, at the head of drainageways, and along drainageways of the Piedmont. Individual areas are irregular in shape and range from about 10 to 100 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 4 inches—grayish brown silt loam

Subsurface layer:
4 to 7 inches—light gray silt loam that has yellow mottles

Subsoil:
7 to 13 inches—yellow silt loam that has brownish yellow and pale brown mottles
13 to 22 inches—brownish yellow silty clay loam that has gray mottles
22 to 34 inches—brownish yellow silty clay that has light gray and strong brown mottles
34 to 46 inches—mottled pale brown, gray, and strong brown silty clay

Substratum:
46 to 58 inches—mottled pale olive, pale yellow, and white saprolite of silty clay loam

Soft bedrock:
58 to 63 inches—mottled pale olive, pale yellow, and white, strongly weathered slate rock

Important soil properties—

Permeability: Very slow
Available water capacity: Moderate
Surface runoff: Slow
Hazard of water erosion: Slight
High water table: At a depth of 1.0 to 2.5 feet from December through May

Included with this unit in mapping are a few areas of Chewacla and Wehadkee soils. The somewhat poorly drained Chewacla soils and the poorly drained Wehadkee soils have a loamy subsoil. They are on flood plains. In some areas soils that have soft weathered bedrock within a depth of 40 inches are intermingled with the Lignum soil. Also included are areas that have 15 percent rock fragments on the surface and in the subsoil. Dissimilar inclusions make up about 15 percent of this map unit.

Most of this map unit is used as woodland. The rest is mainly used as cropland or pasture.

In cultivated areas of this Lignum soil, the major crops are tobacco, corn, and soybeans. A water table that is perched during wet periods and the very slow permeability in the subsoil are the main limitations affecting cropland. Cultivation may be delayed during wet periods. Planting winter cover crops, managing crop residue, and conservation tillage help to maintain tilth and conserve moisture. In areas where slopes are 3 percent, conservation practices, such as no-till planting, stripcropping, crop rotations, contour farming, field borders, grassed waterways, and terraces and diversions, can also help to conserve moisture and control erosion.

In wooded areas, this soil is managed primarily for loblolly pine. The perched water table and competition from undesirable plant species are the main limitations affecting woodland. The perched water table may restrict the use of equipment to periods when the soil is dry. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 76 feet.

The perched water table and the slow permeability in the subsoil are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing diversions that intercept runoff from the higher areas can also minimize problems caused by wetness that affect septic tank absorption fields. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. A specially designed septic system may be needed.

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

LyA—Lynchburg fine sandy loam, 0 to 2 percent slopes. This nearly level, very deep, somewhat poorly drained soil is on broad, smooth, upland flats, in depressions, and along drainageways of the Coastal Plain. Individual areas are irregular in shape and range from about 15 to 300 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 8 inches—dark grayish brown fine sandy loam

Subsoil:
8 to 19 inches—pale brown sandy clay loam that has light gray and brownish yellow mottles
19 to 50 inches—mottled gray, strong brown, and red sandy clay loam

50 to 68 inches—gray sandy clay loam that has brownish yellow, strong brown, and red mottles

Important soil properties—

Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Slow
Hazard of water erosion: Slight
High water table: At a depth of 0.5 foot to 1.5 feet from November through April

Included with this unit in mapping are a few areas of Goldsboro and Rains soils. The moderately well drained Goldsboro soils are in the slightly higher areas. The poorly drained Rains soils are in the slightly lower areas. Also included are soils having a clayey subsoil that are intermingled with the Lynchburg soil in some areas. Dissimilar inclusions make up about 17 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as woodland or pasture.

In drained and cultivated areas of this Lynchburg soil, the major crops are corn, soybeans, and small grain. The high water table is the main limitation affecting cropland. Cultivation may be delayed during wet periods. Artificial drainage systems may be needed to remove excess water, but a lack of suitable outlets can restrict the use of many drainage systems.

In wooded areas, this soil is managed primarily for loblolly pine. The high water table and competition from undesirable plant species are the main limitations affecting woodland. The use of equipment may be restricted to periods when the soil is dry. Artificial drainage systems may be needed to remove excess water, but the lack of suitable outlets can restrict the use of many drainage systems. Intensive site preparation, such as chopping, burning, and bedding, can help to establish seedlings, reduce the seedling mortality rate, and reduce the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 86 feet.

The high water table is the main limitation affecting building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing a drainage system around the septic tank absorption field may be needed to minimize problems caused by wetness and prevent the contamination of ground water. The lack of suitable outlets may be a problem in some areas. A specially designed septic system may be needed.

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

MrA—Marlboro fine sandy loam, 0 to 2 percent slopes. This nearly level, very deep, well drained soil is on broad, smooth, upland ridges of the Coastal Plain. Individual areas are irregular in shape and range from about 5 to 100 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 7 inches—yellowish brown fine sandy loam

Subsoil:
7 to 16 inches—yellowish brown clay loam
16 to 48 inches—yellowish brown clay that has yellowish red mottles
48 to 52 inches—yellowish brown clay that has light gray, yellowish red, and red mottles
52 to 66 inches—mottled yellowish brown, light gray, yellowish red, and red clay
66 to 74 inches—mottled yellowish brown, light gray, yellowish red, and red clay

Important soil properties—

Permeability: Moderate
Available water capacity: High
Surface runoff: Slow
Hazard of water erosion: Slight
High water table: At a depth of 4.0 to 6.0 feet from December through March

Included with this unit in mapping are a few areas of Emporia and Goldsboro soils. Emporia soils have a loamy subsoil that is thinner than that of the Marlboro soil. They are intermingled with the Marlboro soil in some areas. The moderately well drained Goldsboro soils are on flats, in depressions, and along drainageways. Dissimilar inclusions make up about 30 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as pasture or woodland.

In cultivated areas of this Marlboro soil, the major crops are tobacco, cotton, peanuts, corn, soybeans, and small grain. The high water table is the main limitation affecting cropland. Cultivation may be delayed during wet periods. Planting winter cover crops, managing crop residue, and conservation tillage help to maintain tilth and conserve moisture.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species is the main limitation affecting use and management. Intensive site preparation, such as

chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 82 feet.

The high water table and the moderate permeability in the subsoil are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing a drainage system around the septic tank absorption field may be needed to minimize problems caused by wetness and prevent the contamination of ground water. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. A specially designed septic system may be needed.

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

MrB—Marlboro fine sandy loam, 2 to 6 percent slopes. This gently sloping, very deep, well drained soil is on upland ridges and side slopes of the Coastal Plain. Individual areas are irregular in shape and range from about 10 to 100 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 7 inches—yellowish brown fine sandy loam

Subsoil:
7 to 16 inches—yellowish brown clay loam
16 to 48 inches—yellowish brown clay that has yellowish red mottles
48 to 52 inches—yellowish brown clay that has light gray, yellowish red, and red mottles
52 to 66 inches—mottled yellowish brown, light gray, yellowish red, and red clay
66 to 74 inches—mottled yellowish brown, light gray, yellowish red, and red clay

Important soil properties—

Permeability: Moderate
Available water capacity: High
Surface runoff: Medium
Hazard of water erosion: Moderate
High water table: At a depth of 4.0 to 6.0 feet from December through March

Included with this unit in mapping are a few areas of Emporia, Gritney, and Goldsboro soils. Emporia soils have a loamy subsoil that is thinner than that of the Marlboro soil. They are intermingled with the Marlboro soil in some areas. The moderately well drained Gritney soils are on shoulders and in the more sloping areas. The moderately well drained Goldsboro soils are on flats, in depressions, and along drainageways. Also included are small areas of soils that have major properties, use, and management similar to those of the Marlboro soil but have a thinner subsoil. Dissimilar inclusions make up about 10 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as woodland or pasture.

In cultivated areas of this Marlboro soil, the major crops are tobacco, cotton, peanuts, corn, soybeans, and small grain. The hazard of erosion and the high water table are the main limitations affecting cropland. Cultivation may be delayed during wet periods. Planting winter cover crops and managing crop residue help to control runoff and erosion and maintain tilth. Conservation practices, such as no-till planting, stripcropping, crop rotations, contour farming, field borders, grassed waterways, and terraces and diversions, can also help to conserve water and control erosion.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species is the main limitation affecting use and management. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 82 feet.

The high water table and the moderate permeability in the subsoil are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing diversions that intercept runoff from the higher areas can also minimize problems caused by wetness that affect septic tank absorption fields. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. A specially designed septic system may be needed.

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

NaA—Nahunta silt loam, 0 to 2 percent slopes. This nearly level, very deep, somewhat poorly drained soil is on broad, smooth, upland flats, in depressions, and along drainageways of the Coastal Plain. Individual areas are irregular in shape and range from about 15 to 300 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 8 inches—dark grayish brown silt loam

Subsoil:
8 to 19 inches—light yellowish brown loam that has light brownish gray and yellowish brown mottles
19 to 25 inches—light yellowish brown loam that has gray, brownish yellow, and strong brown mottles
25 to 42 inches—gray clay loam that has yellowish brown and yellowish red mottles
42 to 56 inches—gray clay loam that has brownish yellow, very pale brown, and light gray mottles
56 to 69 inches—light gray clay loam that has brownish yellow mottles
69 to 75 inches—gray clay loam that has brownish yellow mottles

Important soil properties—

Permeability: Moderately slow
Available water capacity: High
Surface runoff: Slow
Hazard of water erosion: Slight
High water table: At a depth of 1.0 to 1.5 feet from December through May

Included with this unit in mapping are a few areas of Exum and Grantham soils. The moderately well drained Exum soils are in the slightly higher areas. The poorly drained Grantham soils are in the slightly lower areas. Dissimilar inclusions make up about 23 percent of this map unit.

Most of this map unit is used as woodland. The rest is mainly used as cropland or pasture.

In drained and cultivated areas of this Nahunta soil, the major crops are corn, soybeans, and small grain. The high water table and the moderately slow permeability in the subsoil are the main limitations affecting cropland. Cultivation may be delayed during wet periods. Artificial drainage systems may be needed to remove excess water, but a lack of suitable outlets and the permeability restrict the use of many drainage systems.

In wooded areas, this soil is managed primarily for loblolly pine. The high water table and competition from undesirable plant species are the main limitations affecting woodland. The use of equipment may be restricted to periods when the soil is dry. Artificial drainage systems may be needed to remove excess water, but the lack of suitable outlets can restrict the use of many drainage systems. Intensive site preparation, such as chopping, burning, and bedding, can help to establish seedlings, reduce the seedling mortality rate, and reduce the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 87 feet.

The high water table and the moderately slow permeability in the subsoil are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing a drainage system around the septic tank absorption field may be needed to minimize problems caused by wetness and prevent the contamination of ground water. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. The lack of suitable outlets can restrict the use of many drainage systems. A specially designed septic system may be needed.

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

NkB—Nankin gravelly loamy sand, 1 to 6 percent slopes. This nearly level and gently sloping, very deep, well drained soil is on upland ridges and side slopes in the Fall Line region of the upper Coastal Plain. Individual areas are irregular in shape and range from about 10 to 200 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 9 inches—yellowish brown gravelly loamy sand that has common ironstone nodules (fig. 6)

Subsoil:
9 to 14 inches—strong brown clay that has yellowish red and red mottles and common ironstone nodules
14 to 25 inches—yellowish red clay that has strong brown mottles and common ironstone nodules
25 to 44 inches—red clay that has strong brown mottles and common ironstone nodules
44 to 52 inches—mottled strong brown, yellowish red, and red clay that has few ironstone nodules

Substratum:
52 to 64 inches—mottled strong brown, yellowish red, and red sandy clay loam that has pockets of sandy clay

Important soil properties—

Permeability: Moderately slow
Available water capacity: Moderate
Surface runoff: Medium

Figure 6.—Ironstone nodules on Nankin gravelly loamy sand, 1 to 6 percent slopes.

Hazard of water erosion: Moderate
Depth to high water table: More than 6.0 feet

Included with this unit in mapping are a few areas of Dothan and Emporia soils. These soils have a loamy subsoil. They are intermingled with the Nankin soil in some areas. Dothan soils have more than 5 percent plinthite, by volume, in the subsoil. Also included are small areas of soils that have major properties, use, and management similar to those of the Nankin soil but have a thicker subsoil. Soils in some areas do not have a gravelly surface layer or do not have common

ironstone nodules in the subsoil. Dissimilar inclusions make up about 15 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as woodland or pasture.

In cultivated areas of this Nankin soil, the major crops are tobacco, cotton, peanuts, corn, soybeans, and small grain. The hazard of erosion and the moderately slow permeability in the subsoil are the main limitations affecting cropland. Planting winter cover crops and managing crop residue help to control runoff and erosion and maintain tilth. Conservation practices, such as no-till planting, stripcropping, crop rotations, contour farming, field borders, grassed waterways, and terraces and diversions, can also help to conserve water and control erosion.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species and the high content of clay in the upper 10 inches of the soil are the main limitations affecting woodland. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Unsurfaced roads may be impassable during wet periods because of the high content of clay in the upper 10 inches of the soil. Logging during the drier periods helps to prevent rutting of the surface layer and possible root damage from compaction. Based on a 50-year site curve, the mean site index for loblolly pine is 80 feet.

The moderately slow permeability in the subsoil is the main limitation affecting building site development and septic tank absorption fields in areas of this soil. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. A specially designed septic system may be needed.

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

NoA—Noboco fine sandy loam, 0 to 2 percent slopes. This nearly level, very deep, well drained soil is on broad, smooth, upland ridges of the lower Coastal Plain. Individual areas are irregular in shape and range from about 15 to 100 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 10 inches—yellowish brown fine sandy loam

Subsurface layer:
10 to 18 inches—very pale brown fine sandy loam that has brownish yellow mottles

Subsoil:
18 to 30 inches—yellowish brown sandy clay loam
30 to 42 inches—yellowish brown sandy clay loam that has yellowish red and pale yellow mottles
42 to 54 inches—yellowish brown sandy clay loam that has light gray, yellowish red, and strong brown mottles
54 to 64 inches—yellowish brown sandy clay loam that has light gray, yellowish red, and red mottles and pockets of sandy clay

Important soil properties—

Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Slow
Hazard of water erosion: Slight
High water table: At a depth of 2.5 to 4.0 feet from December through March

Included with this unit in mapping are a few areas of Exum and Goldsboro soils. These moderately well drained soils are on flats, in depressions, and along drainageways. Exum soils have more silt in the subsoil than the Noboco soil. Also included are small areas of soils that have major properties, use, and management similar to those of the Noboco soil but have a thinner subsoil. Dissimilar inclusions make up about 5 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as woodland or pasture.

In cultivated areas of this Noboco soil, the major crops are peanuts, cotton, corn, tobacco, and soybeans. The high water table is the main limitation affecting cropland. Cultivation may be delayed during wet periods. Planting winter cover crops, managing crop residue, and conservation tillage help to maintain tilth and conserve moisture.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species is the main limitation affecting use and management. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 90 feet.

The high water table is the main limitation affecting building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing a drainage system around the septic tank absorption field may be needed to minimize problems caused by wetness and prevent

the contamination of ground water. A specially designed septic system may be needed.

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

PaB—Pacolet sandy loam, 2 to 6 percent slopes. This gently sloping, very deep, well drained soil is on upland ridges and side slopes of the Piedmont. Individual areas are irregular in shape and range from about 10 to 100 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 8 inches—yellowish brown sandy loam

Subsoil:
8 to 27 inches—red clay
27 to 35 inches—red clay loam

Substratum:
35 to 63 inches—mottled white, reddish yellow, and red saprolite of sandy clay loam

Important soil properties—

Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Medium
Hazard of water erosion: Moderate
Depth to high water table: More than 6.0 feet

Included with this unit in mapping are a few areas of Helena soils. These moderately well drained soils are at the head of drainageways and along drainageways. In some areas eroded soils that have a surface layer of sandy clay loam are intermingled with the Pacolet soil. Also included are small areas of soils that have major properties, use, and management similar to those of the Pacolet soil but have a yellow subsoil or a thicker subsoil. Soils in some areas have a surface layer of gravelly sandy loam. Dissimilar inclusions make up about 15 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as woodland or pasture.

In cultivated areas of this Pacolet soil, the major crops are tobacco, corn, soybeans, and small grain. The hazard of erosion is the main limitation affecting cropland. Planting winter cover crops and managing crop residue help to control runoff and erosion and maintain tilth. Conservation practices, such as no-till planting, stripcropping, crop rotations, contour farming, field borders, grassed waterways, and terraces and diversions, can also help to conserve moisture and control erosion.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species and the high content of clay in the upper 10 inches of the soil are the main limitations affecting woodland. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Unsurfaced roads may be impassable during wet periods because of the high content of clay in the upper 10 inches of the soil. Logging during the drier periods helps to prevent rutting of the surface layer and possible root damage from compaction. Based on a 50-year site index curve, the mean site index for loblolly pine is 85 feet.

The moderate permeability in the subsoil is the main limitation affecting building site development and septic tank absorption fields in areas of this soil. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. A specially designed septic system may be needed.

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

PeB2—Pacolet sandy clay loam, 2 to 6 percent slopes, eroded. This gently sloping, very deep, well drained soil is on upland ridges and side slopes of the Piedmont. Individual areas are irregular in shape and range from about 10 to 50 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 2 inches—yellowish red sandy clay loam

Subsoil:
2 to 21 inches—red clay
21 to 28 inches—mottled yellow, white, and red sandy clay loam

Substratum:
28 to 64 inches—mottled yellow, white, brown, and red saprolite of sandy clay loam

Important soil properties—

Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Rapid
Hazard of water erosion: Severe
Depth to high water table: More than 6.0 feet

Included with this unit in mapping are a few areas of Helena soils. These moderately well drained soils are at the head of drainageways and along drainageways. In some areas noneroded soils that have a surface

layer of sandy loam are intermingled with the Pacolet soil. Also included are small areas of soils that have major properties, use, and management similar to those of the Pacolet soil but have a yellow subsoil or a thicker subsoil. Dissimilar inclusions make up about 15 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as woodland or pasture.

In cultivated areas of this Pacolet soil, the major crops are tobacco, corn, soybeans, and small grain. The hazard of erosion and poor tilth are the main limitations affecting cropland. Planting winter cover crops and managing crop residue help to control runoff and erosion and maintain tilth. Conservation practices, such as no-till planting, stripcropping, crop rotations, contour farming, field borders, grassed waterways, and terraces and diversions, can also help to conserve water and control erosion.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species and the high content of clay in the upper 10 inches of the soil are the main limitations affecting woodland. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Unsurfaced roads may be impassable during wet periods because of the high content of clay in the upper 10 inches of the soil. Logging during the drier periods helps to prevent rutting of the surface layer and possible root damage from compaction. Based on a 50-year site curve, the mean site index for loblolly pine is 70 feet.

The moderate permeability in the subsoil is the main limitation affecting building site development and septic tank absorption fields in areas of this soil. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. A specially designed septic system may be needed.

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

RaA—Rains fine sandy loam, 0 to 1 percent slopes. This nearly level, very deep, poorly drained soil is on broad, smooth, upland flats, in depressions, and along drainageways of the Coastal Plain. Individual areas are irregular in shape and range from about 10 to 500 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 7 inches—grayish brown fine sandy loam

Subsoil:
7 to 15 inches—gray sandy clay loam that has brownish yellow and reddish yellow mottles
15 to 28 inches—gray sandy clay loam that has brownish yellow and reddish yellow mottles
28 to 40 inches—gray clay loam that has brownish yellow and reddish yellow mottles
40 to 55 inches—gray clay loam that has brownish yellow, reddish yellow, and yellowish red mottles
55 to 72 inches—gray clay loam that has brownish yellow and reddish yellow mottles

Important soil properties—

Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Slow
Hazard of water erosion: Slight
High water table: Within a depth of 1.0 foot from November through April

Included with this unit in mapping are a few areas of Bethera and Lynchburg soils. Bethera soils have a clayey subsoil. They are intermingled with the Rains soil in some areas. The somewhat poorly drained Lynchburg soils are in the slightly higher areas. Dissimilar inclusions make up about 7 percent of this map unit.

Most of this map unit is used as woodland. The rest is mainly used as cropland or pasture.

In drained and cultivated areas of this Rains soil, the major crops are corn, soybeans, and small grain. The high water table is the main limitation affecting cropland. Cultivation may be delayed during wet periods. Artificial drainage systems may be needed to remove excess water, but a lack of suitable outlets can restrict the use of many drainage systems.

In wooded areas, this soil is managed primarily for loblolly pine. The high water table, competition from undesirable plant species, and a hazard of windthrow are the main limitations affecting woodland. The use of equipment may be restricted to periods when the soil is dry. Artificial drainage systems may be needed to remove excess water, but the lack of suitable outlets can restrict the use of many drainage systems. Intensive site preparation, such as chopping, burning, and bedding, can help to establish seedlings, reduce the seedling mortality rate, and reduce the competition from undesirable plant species. Thinning stands carefully, avoiding damage to surficial root systems, and periodically removing windthrown trees may be needed. Based on a 50-year site curve, the mean site index for loblolly pine is 90 feet.

The high water table is the main limitation affecting building site development and septic tank absorption

fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing a drainage system around the septic tank absorption field may be needed to minimize problems caused by wetness and prevent the contamination of ground water. The lack of suitable outlets may be a problem in some areas. A specially designed septic system may be needed.

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

RmA—Riverview loam, 0 to 1 percent slopes, occasionally flooded. This nearly level, very deep, well drained soil is on flood plains along the Roanoke River and the major streams of the Piedmont and the Coastal Plain. Individual areas are long and narrow and range from about 15 to 100 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 6 inches—very dark grayish brown loam

Subsoil:
6 to 15 inches—strong brown fine sandy loam
15 to 18 inches—strong brown fine sandy loam
18 to 32 inches—strong brown clay loam

Substratum:
32 to 38 inches—strong brown fine sandy loam
38 to 42 inches—brown fine sandy loam
42 to 50 inches—dark brown loam
50 to 63 inches—strong brown fine sandy loam

Important soil properties—

Permeability: Moderate
Available water capacity: High
Surface runoff: Slow
Hazard of water erosion: Slight
High water table: At a depth of 3.0 to 5.0 feet from December through March

Included with this unit in mapping are a few areas of Chewacla soils. These somewhat poorly drained soils are in depressions and along drainageways. Also included are small areas of soils that have major properties, use, and management similar to those of the Riverview soil but have more silt in the subsoil. Dissimilar inclusions make up about 10 percent of this map unit.

Most of the map unit is used as cropland. The rest is mainly used as pasture or woodland.

In cultivated areas of this Riverview soil, the major crops are corn and soybeans. The hazard of flooding and the high water table are the main limitations affecting cropland. Cultivation may be delayed during wet periods. Planting winter cover crops, managing crop residue, and conservation tillage help to maintain tilth and conserve moisture.

In wooded areas, this soil is managed primarily for loblolly pine. The hazard of flooding and competition from undesirable plant species are the main limitations affecting woodland. Intensive site preparation, such as chopping, burning, and bedding, can help to establish seedlings, reduce the seedling mortality rate, and reduce the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 100 feet.

The hazard of flooding and the high water table are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Because of the hazard of occasional flooding, sites for dwellings and septic tank absorption fields should be selected on more suitable soils.

The land capability subclass is IIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 11A.

RoA—Roanoke loam, 0 to 2 percent slopes, occasionally flooded. This nearly level, very deep, poorly drained soil is on broad, smooth flats, in depressions, and along drainageways on fluvial terraces along the Roanoke River and its major tributaries. Individual areas are irregular in shape and range from about 10 to 500 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 5 inches—very dark gray loam

Subsurface layer:
5 to 8 inches—grayish brown loam that has yellowish brown mottles

Subsoil:
8 to 52 inches—gray clay that has light yellowish brown and strong brown mottles

Substratum:
52 to 70 inches—mottled light brownish gray and yellowish red loam

Important soil properties—

Permeability: Very slow
Available water capacity: Moderate
Surface runoff: Very slow

Hazard of water erosion: Slight
High water table: Within a depth of 1.0 foot from November through May

Included with this unit in mapping are a few areas of Dogue, Wahee, and Tomotley soils. The moderately well drained Dogue soils and the somewhat poorly drained Wahee soils are in the slightly higher areas. Tomotley soils have a loamy subsoil. They are intermingled with the Roanoke soil in some areas. Dissimilar inclusions make up about 5 percent of this map unit.

Most of this map unit is used as woodland. The rest is mainly used as cropland or pasture.

In drained and cultivated areas of this Roanoke soil, the major crops are corn, soybeans, and small grain. The hazard of flooding, the high water table, and the very slow permeability in the subsoil are the main limitations affecting cropland. Cultivation may be delayed during wet periods. Artificial drainage systems may be needed to remove excess water, but a lack of suitable outlets and the permeability restrict the use of many drainage systems.

In wooded areas, this soil is managed primarily for loblolly pine. The hazard of flooding, the high water table, competition from undesirable plant species, the high content of clay in the upper 10 inches of the soil, and a hazard of windthrow are the main limitations affecting woodland. The use of equipment may be restricted to periods when the soil is dry. Artificial drainage systems may be needed to remove excess water, but the lack of suitable outlets can restrict the use of many drainage systems. Intensive site preparation, such as chopping, burning, and bedding, can help to establish seedlings, reduce the seedling mortality rate, and reduce the competition from undesirable plant species. Unsurfaced roads may be impassable during wet periods because of the high content of clay in the upper 10 inches of the soil. Logging during the drier periods helps to prevent rutting of the surface layer and possible root damage from compaction. Thinning stands carefully, avoiding damage to surficial root systems, and periodically removing windthrown trees may be needed. Based on a 50-year site curve, the mean site index for loblolly pine is 98 feet where the soil is drained. Based on a 50-year site curve, the mean site index for sweetgum is 90 feet where the soil is undrained.

The hazard of flooding, the high water table, and the very slow permeability in the subsoil are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Because of the hazard of occasional flooding, sites for dwellings and septic tank absorption fields should be selected on more suitable soils.

The land capability subclass is IIIw in drained areas and IVw in undrained areas. Based on loblolly pine as the indicator species, the woodland ordination symbol is 10W in drained areas. Based on sweetgum as the indicator species, it is 7W in undrained areas.

SeA—Seabrook loamy sand, 0 to 2 percent slopes, rarely flooded. This nearly level, very deep, moderately well drained soil is on broad, smooth flats, in depressions, and along drainageways on fluvial terraces along Fishing Creek. Individual areas are irregular in shape and range from about 15 to 50 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 9 inches—dark brown loamy sand

Substratum:
9 to 24 inches—yellowish brown loamy sand
24 to 31 inches—light yellowish brown loamy sand that has light gray mottles
31 to 36 inches—light yellowish brown coarse sand that has light gray mottles
36 to 63 inches—yellowish brown coarse sand that has light brownish gray mottles

Important soil properties—

Permeability: Rapid
Available water capacity: Very low
Surface runoff: Slow
Hazard of water erosion: Slight
High water table: At a depth of 2.0 to 3.0 feet from December through March

Included with this unit in mapping are a few areas of Altavista and Tarboro soils. Altavista soils have a loamy subsoil. They are intermingled with the Seabrook soil in some areas. The somewhat excessively drained Tarboro soils are in the slightly higher areas. Dissimilar inclusions make up about 25 percent of this map unit.

Most of this map unit is used as woodland. The rest is mainly used as cropland or pasture. Some areas are excavated for sand.

In cultivated areas of this Seabrook soil, the major crops are soybeans and corn. The hazard of flooding, the high water table, the droughtiness of the thick, sandy layer, a hazard of soil blowing, the low available water capacity, and the leaching of plant nutrients are the main limitations affecting cropland. Cultivation may be delayed during wet periods, and irrigation may be needed during dry periods. Blowing sand may damage young plants. Planting winter cover crops, managing

crop residue, conservation tillage, establishing windbreaks, and including close-growing grasses and legumes in the cropping system help to control soil blowing, maintain tilth, and conserve moisture. Fertilizers, particularly nitrogen, should be used in split applications.

In wooded areas, this soil is managed primarily for loblolly pine. The droughtiness of the thick, sandy layer and the low available water capacity are the main limitations affecting woodland. The droughtiness may cause seedling mortality during dry periods. When dry, the sandy layers are soft and may limit the use of equipment. Based on a 50-year site curve, the mean site index for loblolly pine is 81 feet.

The hazard of flooding, the high water table, and a poor filtering capacity are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Because of the hazard of rare flooding, sites for dwellings and septic tank absorption fields should be selected on more suitable soils.

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

StA—State fine sandy loam, 0 to 2 percent slopes. This nearly level, very deep, well drained soil is on broad, smooth ridges on fluvial terraces along the Roanoke River, Fishing Creek, and the larger streams in the county. Individual areas are irregular in shape and range from about 15 to 100 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 6 inches—dark yellowish brown fine sandy loam

Subsoil:
6 to 15 inches—strong brown sandy clay loam
15 to 44 inches—strong brown sandy clay loam
44 to 53 inches—strong brown fine sandy loam

Substratum:
53 to 66 inches—strong brown very fine sandy loam
66 to 75 inches—yellowish brown very fine sandy loam

Important soil properties—

Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Slow
Hazard of water erosion: Slight
High water table: At a depth of 4.0 to 6.0 feet from December through June

Included with this unit in mapping are a few areas of Altavista soils. These moderately well drained soils are on flats, in depressions, and along drainageways. Also included are small areas of soils that have major properties, use, and management similar to those of the State soil but have a red subsoil. Soils in some areas have more clay or more sand in the subsoil. Dissimilar inclusions make up about 5 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as woodland or pasture.

In cultivated areas of this State soil, the major crops are peanuts, cotton, soybeans, corn, and small grain. There are no significant limitations affecting cropland. Planting winter cover crops, managing crop residue, and conservation tillage help to maintain tilth and conserve moisture.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species is the main limitation affecting use and management. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 86 feet.

The high water table is the main limitation affecting building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing a drainage system around the septic tank absorption field may be needed to minimize problems caused by wetness and prevent the contamination of ground water. A specially designed septic system may be needed.

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

StB—State fine sandy loam, 2 to 6 percent slopes. This gently sloping, very deep, well drained soil is on ridges on fluvial terraces along the Roanoke River, Fishing Creek, and the larger streams in the county. Individual areas are irregular in shape and range from about 15 to 75 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 6 inches—dark yellowish brown fine sandy loam

Subsoil:
6 to 15 inches—strong brown sandy clay loam

15 to 44 inches—strong brown sandy clay loam
44 to 53 inches—strong brown fine sandy loam

Substratum:
53 to 66 inches—strong brown very fine sandy loam
66 to 75 inches—yellowish brown very fine sandy loam

Important soil properties—

Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Medium
Hazard of water erosion: Moderate
High water table: At a depth of 4.0 to 6.0 feet from December through June

Included with this unit in mapping are a few areas of Altavista and Bojac soils. The moderately well drained Altavista soils are on flats, in depressions, and along drainageways. Bojac soils have a sandy subsoil. They are intermingled with the State soil in some areas. In some areas eroded soils that have a surface layer of sandy clay loam are intermingled with the State soil. Also included are small areas of soils that have major properties, use, and management similar to those of the State soil but have a red subsoil. Soils in some areas have more clay in the subsoil. Dissimilar inclusions make up about 20 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as woodland or pasture.

In cultivated areas of this State soil, the major crops are peanuts, cotton, soybeans, corn, and small grain. The hazard of erosion is the main limitation affecting cropland. Planting winter cover crops and managing crop residue help to maintain tilth and conserve moisture. Conservation practices, such as no-till planting, stripcropping, crop rotations, contour farming, field borders, grassed waterways, and terraces and diversions, can also help to conserve moisture and control erosion.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species is the main limitation affecting use and management. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 86 feet.

The high water table is the main limitation affecting building site development and septic tank absorption fields in areas of this soil. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing diversions that intercept runoff from the higher areas can also minimize problems caused by wetness that affect septic tank absorption fields. A specially designed septic system may be needed.

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

TaA—Tarboro loamy sand, 0 to 3 percent slopes. This nearly level, very deep, somewhat excessively drained soil is on broad, smooth ridges on fluvial terraces along Fishing Creek. Individual areas are irregular in shape and range from about 10 to 150 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 9 inches—dark yellowish brown loamy sand

Substratum:
9 to 29 inches—strong brown loamy sand
29 to 60 inches—brownish yellow coarse sand
60 to 82 inches—light yellowish brown coarse sand

Important soil properties—

Permeability: Very rapid
Available water capacity: Very low
Surface runoff: Slow
Hazard of water erosion: Slight
Depth to high water table: More than 6.0 feet

Included with this unit in mapping are a few areas of Seabrook and Bojac soils. The moderately well drained Seabrook soils are on flats, in depressions, and along drainageways. Bojac soils have a loamy subsoil. They are intermingled with the Tarboro soil in some areas. Dissimilar inclusions make up about 5 percent of this map unit.

Most of this map unit is used as woodland. The rest is mainly used as cropland or pasture. Some areas are excavated for sand (fig. 7).

In cultivated areas of this Tarboro soil, the major crops are peanuts, corn, and soybeans. The droughtiness of the thick, sandy layer, a hazard of soil blowing, the low available water capacity, and the leaching of plant nutrients are the main limitations affecting cropland. Irrigation may be needed during dry periods. Blowing sand may damage young plants. Planting winter cover crops, managing crop residue, conservation tillage, establishing windbreaks, and including close-growing grasses and legumes in the cropping system help to control soil blowing, maintain tilth, and conserve moisture. Fertilizers, particularly nitrogen, should be used in split applications.

Figure 7.—An area of Tarboro loamy sand, 0 to 3 percent slopes, that has been mined for sand.

In wooded areas, this soil is managed primarily for loblolly pine. The droughtiness of the thick, sandy layer and the low available water capacity are the main limitations affecting woodland. The droughtiness may cause seedling mortality during dry periods. When dry, the sandy layers are soft and may limit the use of equipment. Based on a 50-year site curve, the mean site index for loblolly pine is 72 feet.

A poor filtering capacity is the main limitation affecting building site development and septic tank absorption fields in areas of this soil. Locating all septic tank drainage lines away from water sources helps to prevent the contamination of nearby ground-water supplies. Backfilling septic tank drainage lines with finer textured material may be needed. A specially designed septic system also may be needed.

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

TbE—Tatum silt loam, 10 to 25 percent slopes. This strongly sloping and moderately steep, deep, well drained soil is on side slopes of the Piedmont. Individual areas are long and narrow and range from about 10 to 75 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 5 inches—dark brown silt loam

Subsoil:
5 to 26 inches—red silty clay
26 to 40 inches—red silty clay that has brownish yellow mottles
40 to 49 inches—mottled brownish yellow and red silty clay loam

Substratum:
49 to 54 inches—mottled brownish yellow, light gray, and red saprolite of silt loam

Soft bedrock:
54 to 63 inches—mottled light gray and red, strongly weathered slate rock

Important soil properties—

Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Rapid
Hazard of water erosion: Severe
Depth to high water table: More than 6.0 feet

Included with this unit in mapping are a few areas of dissimilar soils. Eroded soils having a surface layer of silty clay loam and soils having soft weathered bedrock within a depth of 40 inches are intermingled with the Tatum soil in some areas. Also included are small areas of soils that have major properties, use, and management similar to those of the Tatum soil but have a yellow subsoil. Dissimilar inclusions make up about 10 percent of this map unit.

Most of this map unit is used as woodland. The rest is mainly used as pasture. The map unit is rarely used as cropland. The slope is the main limitation affecting the use and management of cropland.

In wooded areas, this Tatum soil is managed primarily for loblolly pine. The slope, the hazard of erosion, competition from undesirable plant species, and the high content of clay in the upper 10 inches of the soil are the main limitations affecting woodland. The slope may limit the use of equipment. Logging roads and skid trails should be installed on the contour. Water bars and culverts can help to prevent erosion on sloping roads. Filter strips can help to prevent stream sedimentation. Stream crossings, if possible, should not be used. If stream crossings are necessary, culverts should be installed. When harvesting is completed, logging roads, skid trails, and logging decks should be seeded. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Unsurfaced roads may be impassable during wet periods because of the high content of clay in the upper 10 inches of the soil. Logging during the drier periods helps to prevent rutting of the surface layer and possible root damage from compaction. Based on a 50-year site curve, the mean site index for loblolly pine is 75 feet.

The slope is the main limitation affecting building site development and septic tank absorption fields in areas of this soil. Designing dwellings so that they conform to the natural slope and land shaping can help to overcome the slope limitation. A specially designed septic system may be needed.

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

TmB2—Tatum silty clay loam, 2 to 6 percent slopes, eroded. This gently sloping, deep, well drained soil is on upland ridges and side slopes of the Piedmont. Individual areas are irregular in shape and range from about 10 to 75 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 6 inches—strong brown silty clay loam that has yellowish red mottles

Subsoil:
6 to 20 inches—red silty clay that has brownish yellow mottles
20 to 35 inches—red silty clay that has brownish yellow mottles

Substratum:
35 to 50 inches—mottled yellow, light gray, weak red, and red saprolite of silt loam

Soft bedrock:
50 to 62 inches—mottled light gray and red, strongly weathered slate rock

Important soil properties—

Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Medium
Hazard of water erosion: Severe
Depth to high water table: More than 6.0 feet

Included with this unit in mapping are a few areas of Lignum soils. These moderately well drained and somewhat poorly drained soils are on flats, at the head of drainageways, and along drainageways. In some areas noneroded soils that have a surface layer of silt loam or a gravelly surface layer are intermingled with the Tatum soil. Soils having soft weathered bedrock within a depth of 40 inches and soils having soft weathered bedrock below a depth of 60 inches are intermingled with the Tatum soil in some areas. Also included are small areas of soils that have major properties, use, and management similar to those of the Tatum soil but have a yellow subsoil or a thicker subsoil. Dissimilar inclusions make up about 15 percent of this map unit.

Most of this map unit is used as woodland. The rest is mainly used as cropland or pasture.

In cultivated areas of this Tatum soil, the major crops are soybeans, tobacco, and corn. The hazard of erosion and poor tilth are the main limitations affecting cropland. Planting winter cover crops and managing crop residue help to control runoff and erosion and maintain tilth. Conservation practices, such as no-till planting, stripcropping, crop rotations, contour farming, field borders, grassed waterways, and terraces and diversions, can also help to conserve water and control erosion.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species and the high content of clay in the upper 10 inches of the soil are the main limitations affecting woodland. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Unsurfaced roads may be impassable during wet periods because of the high content of clay in the upper 10 inches of the soil. Logging during the drier periods helps to prevent rutting of the surface layer and possible root damage from compaction. Based on a 50-year site curve, the mean site index for loblolly pine is 75 feet.

The moderate permeability in the subsoil, a moderate shrink-swell potential, and the depth to soft bedrock are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. Placing extra reinforcement in footings and foundations and backfilling with sandy material can minimize the damage caused by the shrinking and swelling of clay. Areas of the deeper, included soils may be better suited to absorption fields. A specially designed septic system may be needed.

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

TmC2—Tatum silty clay loam, 6 to 10 percent slopes, eroded. This moderately sloping, deep, well drained soil is on side slopes of the Piedmont. Individual areas are irregular in shape and range from about 10 to 75 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 6 inches—strong brown silty clay loam that has yellowish red mottles

Subsoil:
6 to 20 inches—red silty clay that has brownish yellow mottles
20 to 35 inches—red silty clay that has brownish yellow mottles

Substratum:
35 to 50 inches—mottled yellow, light gray, weak red, and red saprolite of silt loam

Soft bedrock:
50 to 62 inches—mottled light gray and red, strongly weathered slate rock

Important soil properties—

Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Rapid
Hazard of water erosion: Severe
Depth to high water table: More than 6.0 feet

Included with this unit in mapping are a few areas of Lignum soils. These moderately well drained and somewhat poorly drained soils are at the head of drainageways and along drainageways. Noneroded soils that have a surface layer of silt loam or a gravelly surface layer, soils that have soft weathered bedrock within a depth of 40 inches, and soils that have soft weathered bedrock below a depth of 60 inches are intermingled with the Tatum soil in some areas. Also included are small areas of soils that have major properties, use, and management similar to those of the Tatum soil but have a yellow subsoil or a thicker subsoil. Dissimilar inclusions make up about 10 percent of this map unit.

Most of this map unit is used as woodland. The rest is mainly used as cropland or pasture.

In cultivated areas of this Tatum soil, the major crops are soybeans and corn. The slope, the hazard of erosion, and poor tilth are the main limitations affecting cropland. Planting winter cover crops and managing

crop residue help to control runoff and erosion and maintain tilth. Conservation practices, such as no-till planting, stripcropping, crop rotations, contour farming, field borders, grassed waterways, and terraces and diversions, can also help to conserve water and control erosion.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species and the high content of clay in the upper 10 inches of the soil are the main limitations affecting woodland. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Unsurfaced roads may be impassable during wet periods because of the high content of clay in the upper 10 inches of the soil. Logging during the drier periods helps to prevent rutting of the surface layer and possible root damage from compaction. Based on a 50-year site curve, the mean site index for loblolly pine is 75 feet.

The moderate permeability in the subsoil, the slope, a moderate shrink-swell potential, and the depth to soft bedrock are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. Designing dwellings so that they conform to the natural slope and land shaping can help to overcome the slope limitation. Placing extra reinforcement in footings and foundations and backfilling with sandy material can minimize the damage caused by the shrinking and swelling of clay. Areas of the deeper, included soils may be better suited to absorption fields. A specially designed septic system may be needed.

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

TtA—Tomotley fine sandy loam, 0 to 2 percent slopes, rarely flooded. This nearly level, very deep, poorly drained soil is on broad, smooth flats, in depressions, and along drainageways on fluvial terraces along the Roanoke River, Fishing Creek, and the larger streams in the county. Individual areas are irregular in shape and range from about 50 to 150 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 5 inches—dark grayish brown fine sandy loam

Subsoil:
5 to 9 inches—dark grayish brown fine sandy loam that has dark gray and strong brown mottles
9 to 23 inches—light gray clay loam that has yellowish brown and strong brown mottles
23 to 31 inches—gray clay loam that has yellowish brown mottles
31 to 40 inches—gray sandy loam that has yellowish brown mottles and pockets of sandy clay loam

Substratum:
40 to 45 inches—mottled gray, yellow, and yellowish brown fine sandy loam
45 to 51 inches—light gray loamy sand that has yellow and yellowish brown mottles
51 to 60 inches—light gray sand

Important soil properties—

Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Slow
Hazard of water erosion: Slight
High water table: Within a depth of 1.0 foot from November through April

Included with this unit in mapping are a few areas of Roanoke soils. These soils have a clayey subsoil. They are intermingled with the Tomotley soil in some areas. Some areas along Fishing Creek may be more than rarely flooded. Also included are small areas of soils that have major properties, use, and management similar to those of the Tomotley soil but are somewhat poorly drained. Dissimilar inclusions make up about 15 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as woodland or pasture.

In drained and cultivated areas of this Tomotley soil, the major crops are corn and soybeans. The hazard of flooding and the high water table are the main limitations affecting cropland. Cultivation may be delayed during wet periods. Artificial drainage systems may be needed to remove excess water, but a lack of suitable outlets can restrict the use of many drainage systems.

In wooded areas, this soil is managed primarily for loblolly pine. The hazard of flooding, the high water table, competition from undesirable plant species, and a hazard of windthrow are the main limitations affecting woodland. The use of equipment may be restricted to periods when the soil is dry. Artificial drainage systems may be needed to remove excess water, but the lack of suitable outlets can restrict the use of many drainage systems. Intensive site

preparation, such as chopping, burning, and bedding, can help to establish seedlings, reduce the seedling mortality rate, and reduce the competition from undesirable plant species. Thinning stands carefully, avoiding damage to surficial root systems, and periodically removing windthrown trees may be needed. Based on a 50-year site curve, the mean site index for loblolly pine is 97 feet.

The hazard of flooding and the high water table are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Because of the hazard of rare flooding, sites for dwellings and septic tank absorption fields should be selected on more suitable soils.

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

TuB—Turbeville fine sandy loam, 2 to 6 percent slopes. This gently sloping, very deep, well drained soil is on ridges on old fluvial terraces of the Roanoke River in the area of Roanoke Rapids and Weldon. Individual areas are irregular in shape and range from about 20 to 150 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 9 inches—brown fine sandy loam

Subsoil:
9 to 12 inches—mottled strong brown and yellowish red sandy clay loam
12 to 17 inches—red clay loam
17 to 24 inches—red clay
24 to 44 inches—red clay that has brown mottles
44 to 59 inches—dark red clay
59 to 86 inches—dark red clay that has strong brown mottles

Important soil properties—

Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Medium
Hazard of water erosion: Moderate
Depth to high water table: More than 6.0 feet

Included with this unit in mapping are a few areas of Emporia and Gritney soils. Emporia soils have a loamy subsoil that is thinner than that of the Turbeville soil. They are intermingled with the Turbeville soil in some areas. The moderately well drained Gritney soils are on shoulders. Eroded soils that have a surface layer of sandy clay loam are intermingled with the Turbeville soil in some areas. Also included are small areas of soils that have major properties, use, and management similar to those of the Turbeville soil but have a yellow subsoil or a thinner subsoil. Dissimilar inclusions make up about 10 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as woodland, pasture, or urban land.

In cultivated areas of this Turbeville soil, the major crops are peanuts, tobacco, cotton, corn, and soybeans. The hazard of erosion is the main limitation affecting cropland. Planting winter cover crops and managing crop residue help to control runoff and erosion and maintain tilth. Conservation practices, such as no-till planting, stripcropping, crop rotations, contour farming, field borders, grassed waterways, and terraces and diversions, can also help to conserve water and control erosion.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species is the main limitation affecting use and management. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 80 feet.

The moderate permeability in the subsoil and a moderate shrink-swell potential are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. Placing extra reinforcement in footings and foundations and backfilling with sandy material can minimize the damage caused by the shrinking and swelling of clay. A specially designed septic system may be needed.

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

Ud—Udorthents, loamy. These nearly level to moderately sloping, well drained and moderately well drained soils are on uplands and fluvial terraces where natural soil material has been excavated or covered by earthy fill material. Individual areas are irregular in shape and range from about 5 to 50 acres in size.

Udorthents generally occur in cut and fill areas or in areas of borrow pits where soil material has been removed and placed on an adjacent site. Other areas of Udorthents include quarries, sand pits, landfills, and recreational areas, such as playgrounds. Because of the variable nature of the soils, a typical pedon is not given.

Important soil properties—

Permeability: Moderate to slow
Available water capacity: Low to high
Surface runoff: Medium to rapid
Hazard of water erosion: Moderate to severe
High water table: Variable; commonly at a depth of 4 to 6 feet from December through March

Included with this unit in mapping are a few areas of somewhat poorly drained and poorly drained soils on flats, in depressions, and along drainageways. Some soils have a clayey or sandy subsoil. Dissimilar inclusions make up about 25 percent of this map unit.

Most of this map unit is used as woodland. The rest is mainly used for urban development or as recreational areas. The highly variable soil properties are the main limitation affecting the use and management of cropland.

In wooded areas, this map unit is primarily unmanaged. The highly disturbed areas and the variable soil properties are the main limitations affecting woodland. Intensive site preparation, such as chopping, burning, and bedding, can help to establish seedlings, reduce the seedling mortality rate, and reduce competition from undesirable plant species. Because of the variability of this map unit, a mean site index is not given.

The high water table and the variability of the soil properties are the main limitations affecting building site development and septic tank absorption fields in areas of this map unit. Sites for dwellings and septic tank absorption fields should be selected on more suitable soils.

The land capability subclass is VIIs. This map unit is not assigned a woodland ordination symbol.

WaA—Wahee silt loam, 0 to 2 percent slopes, rarely flooded. This nearly level, very deep, somewhat poorly drained soil is on broad, smooth flats, in depressions, and along drainageways on fluvial terraces along the Roanoke River and its major tributaries. Individual areas are irregular in shape and range from about 10 to 50 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 3 inches—dark grayish brown silt loam

Subsurface layer:
3 to 7 inches—light yellowish brown silt loam

Subsoil:
7 to 13 inches—light yellowish brown clay loam that has light gray and reddish yellow mottles
13 to 31 inches—mottled light yellowish brown, light brownish gray, reddish yellow, and red clay
31 to 48 inches—light brownish gray clay that has reddish yellow mottles

Substratum:
48 to 60 inches—light brownish gray clay that has reddish yellow mottles

Important soil properties—

Permeability: Slow
Available water capacity: Moderate
Surface runoff: Slow
Hazard of water erosion: Slight
High water table: At a depth of 0.5 foot to 1.5 feet from December through March

Included with this unit in mapping are a few areas of Altavista, Dogue, and Roanoke soils. The moderately well drained Altavista and Dogue soils are in the slightly higher areas. Altavista soils have a loamy subsoil. The poorly drained Roanoke soils are in the slightly lower areas. Dissimilar inclusions make up about 25 percent of this map unit.

Most of this map unit is used as woodland. The rest is mainly used as cropland or pasture.

In drained and cultivated areas of this Wahee soil, the major crops are corn, soybeans, and small grain. The hazard of flooding, the high water table, and the slow permeability in the subsoil are the main limitations affecting cropland. Cultivation may be delayed during wet periods. Artificial drainage systems may be needed to remove excess water, but a lack of suitable outlets and the permeability restrict the use of many drainage systems.

In wooded areas, this soil is managed primarily for loblolly pine. The high water table and competition from undesirable plant species are the main limitations affecting woodland. The use of equipment may be restricted to periods when the soil is dry. Artificial drainage systems may be needed to remove excess water, but the lack of suitable outlets can restrict the use of many drainage systems. Intensive site preparation, such as chopping, burning, and bedding, can help to establish seedlings, reduce the seedling mortality rate, and reduce the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 86 feet.

The hazard of flooding, the high water table, and the slow permeability in the subsoil are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Because of the hazard of rare flooding, sites for dwellings and septic tank absorption fields should be selected on more suitable soils.

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

WeB—Wedowee sandy loam, 2 to 6 percent slopes. This gently sloping, very deep, well drained soil is on upland ridges and side slopes of the Piedmont. Individual areas are irregular in shape and range from about 10 to 250 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 7 inches—dark brown sandy loam

Subsoil:
7 to 10 inches—yellowish brown sandy loam
10 to 19 inches—strong brown clay that has yellowish red mottles
19 to 26 inches—strong brown clay that has brownish yellow and red mottles
26 to 36 inches—strong brown clay loam that has brownish yellow, white, and red mottles

Substratum:
36 to 63 inches—mottled strong brown, brownish yellow, pink, white, and red saprolite of sandy clay loam

Important soil properties—

Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Medium
Hazard of water erosion: Moderate
Depth to high water table: More than 6.0 feet

Included with this unit in mapping are a few areas of Helena soils. These moderately well drained soils are at the head of drainageways and along drainageways. In some areas eroded soils that have a surface layer of sandy clay loam are intermingled with the Wedowee soil. Also included are small areas of soils that have major properties, use, and management similar to those of the Wedowee soil but have a red subsoil or a thicker subsoil. Dissimilar inclusions make up about 5 percent of this map unit.

Most of this map unit is used as cropland. The rest is mainly used as woodland or pasture.

In cultivated areas of this Wedowee soil, the major crops are tobacco, corn, soybeans, and small grain. The hazard of erosion is the main limitation affecting cropland. Planting winter cover crops and managing crop residue help to control runoff and erosion and maintain tilth. Conservation practices, such as no-till planting, stripcropping, crop rotations, contour farming, field borders, grassed waterways, and terraces and diversions, can also help to conserve water and control erosion.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species is the main limitation affecting use and management. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 87 feet.

The moderate permeability in the subsoil is the main limitation affecting building site development and septic tank absorption fields in areas of this soil. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. A specially designed septic system may be needed.

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

WeC—Wedowee sandy loam, 6 to 10 percent slopes. This moderately sloping, very deep, well drained soil is on side slopes of the Piedmont. Individual areas are long and narrow and range from about 10 to 75 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 7 inches—dark brown sandy loam

Subsoil:
7 to 10 inches—yellowish brown sandy loam
10 to 19 inches—strong brown clay that has yellowish red mottles
19 to 26 inches—strong brown clay that has brownish yellow and red mottles
26 to 36 inches—strong brown clay loam that has brownish yellow, white, and red mottles

Substratum:
36 to 63 inches—mottled strong brown, brownish yellow, pink, white, and red saprolite of sandy clay loam

Important soil properties—

Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Rapid
Hazard of water erosion: Severe
Depth to high water table: More than 6.0 feet

Included with this unit in mapping are a few areas of Helena soils. These moderately well drained soils are at the head of drainageways and along drainageways. In some areas soils that have a loamy subsoil are

intermingled with the Wedowee soil. Also included are small areas of soils that have major properties, use, and management similar to those of the Wedowee soil but have a red subsoil or a thicker subsoil. Dissimilar inclusions make up about 5 percent of this map unit.

Most of this map unit is used as woodland. The rest is mainly used as cropland or pasture.

In cultivated areas of this Wedowee soil, the major crops are tobacco, corn, soybeans, and small grain. The slope and the hazard of erosion are the main limitations affecting cropland. Planting winter cover crops and managing crop residue help to control runoff and erosion and maintain tilth. Conservation practices, such as no-till planting, stripcropping, crop rotations, contour farming, field borders, grassed waterways, and terraces and diversions, can also help to conserve water and control erosion.

In wooded areas, this soil is managed primarily for loblolly pine. Competition from undesirable plant species is the main limitation affecting use and management. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 87 feet.

The moderate permeability in the subsoil and the slope are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. Designing dwellings so that they conform to the natural slope, land shaping, and installing the septic tank absorption lines on the contour can help to overcome the slope limitation. A specially designed septic system may be needed.

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

WeE—Wedowee sandy loam, 10 to 25 percent slopes. This strongly sloping and moderately steep, very deep, well drained soil is on side slopes of the Piedmont. Individual areas are long and narrow and range from about 15 to 50 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 7 inches—dark brown sandy loam

Subsoil:
7 to 10 inches—yellowish brown sandy loam
10 to 19 inches—strong brown clay that has yellowish red mottles
19 to 26 inches—strong brown clay that has brownish yellow and red mottles
26 to 36 inches—strong brown clay loam that has brownish yellow, white, and red mottles

Substratum:
36 to 63 inches—mottled strong brown, brownish yellow, pink, white, and red saprolite of sandy clay loam

Important soil properties—

Permeability: Moderate
Available water capacity: Moderate
Surface runoff: Rapid
Hazard of water erosion: Severe
Depth to high water table: More than 6.0 feet

Included with this unit in mapping are a few areas of Helena soils. These moderately well drained soils are at the head of drainageways and along drainageways. In some areas soils that have a loamy subsoil are intermingled with the Wedowee soil. Also included are small areas of soils that have major properties, use, and management similar to those of the Wedowee soil but have a red subsoil or have a surface layer of gravelly sandy loam. Dissimilar inclusions make up about 10 percent of this map unit.

Most of this map unit is used as woodland. The rest is mainly used as pasture. The map unit is rarely used as cropland. The slope is the main limitation affecting the use and management of cropland.

In wooded areas, this Wedowee soil is managed primarily for loblolly pine. The slope, the hazard of erosion, and competition from undesirable plant species are the main limitations affecting woodland. The slope may limit the use of equipment. Logging roads and skid trails should be installed on the contour. Water bars and culverts can help to prevent erosion on sloping roads. Filter strips can help to prevent stream sedimentation. Stream crossings, if possible, should not be used. If stream crossings are necessary, culverts should be installed. When harvesting is completed, logging roads, skid trails, and logging decks should be seeded. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 87 feet.

The slope is the main limitation affecting building site development and septic tank absorption fields in areas of this soil. Designing dwellings so that they conform to the natural slope and land shaping can help to overcome the slope limitation. A specially designed septic system may be needed.

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

WnF—Winton fine sandy loam, 25 to 45 percent slopes. This steep, very deep, moderately well drained soil is on bluffs along the Roanoke River and on side slopes of the Coastal Plain. Individual areas are long and narrow and range from about 20 to 100 acres in size.

Typically, the sequence, depth, color, and texture of the layers of this soil are as follows—

Surface layer:
0 to 5 inches—very dark grayish brown fine sandy loam

Subsurface layer:
5 to 9 inches—pale brown fine sandy loam

Subsoil:
9 to 14 inches—pale yellow sandy clay loam
14 to 23 inches—brownish yellow sandy clay loam that has strong brown mottles
23 to 38 inches—brownish yellow clay loam that has gray and strong brown mottles
38 to 57 inches—mottled brownish yellow, gray, and strong brown clay loam
57 to 63 inches—mottled strong brown and light gray sandy clay loam that has pockets of sandy loam

Important soil properties—

Permeability: Moderate or moderately slow
Available water capacity: Moderate
Surface runoff: Rapid
Hazard of water erosion: Severe
High water table: At a depth of 2.0 to 3.5 feet from December through May

Included with this unit in mapping are a few areas of Chewacla soils. These somewhat poorly drained soils are on flood plains. In some areas soils that are well drained or have a clayey subsoil are intermingled with the Winton soil. Also included are small areas of soils that have major properties, use, and management similar to those of the Winton soil but have slopes of 15 to 25 percent. Dissimilar inclusions make up about 10 percent of this map unit.

Most of this map unit is used as woodland. The map unit is rarely used as cropland or pasture. The slope is the main limitation affecting the use and management of cropland.

In wooded areas, this Winton soil is managed primarily for loblolly pine. The slope, the hazard of erosion, and competition from undesirable plant species are the main limitations affecting woodland. The slope may limit the use of equipment. Logging roads and skid trails should be installed on the contour. Water bars and culverts can help to prevent erosion on sloping roads. Filter strips can help to prevent stream sedimentation. Stream crossings, if possible, should not be used. If stream crossings are necessary, culverts should be installed. When harvesting is completed, logging roads, skid trails, and logging decks should be seeded. Intensive site preparation, such as chopping, burning, and applying herbicides, helps to control the competition from undesirable plant species. Based on a 50-year site curve, the mean site index for loblolly pine is 80 feet.

The slope, the perched water table, and the moderate permeability in the subsoil are the main limitations affecting building site development and septic tank absorption fields in areas of this soil. In the less sloping areas, designing dwellings so that they conform to the natural slope, land shaping, and installing the septic tank absorption lines on the contour can help to overcome the slope limitation. Installing drainage systems next to footings, adequately sealing foundations, and land shaping so that surface water and runoff are directed away from dwellings can minimize problems caused by wetness. Installing diversions that intercept runoff from the higher areas can also minimize problems caused by wetness that affect septic tank absorption fields. Increasing the size of the septic tank absorption field can help to minimize the permeability limitation. A specially designed septic system may be needed.

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 Halifax 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. Because the acreage of high-quality farmland is limited, 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 Halifax County. The location of each map unit is shown on the detailed soil maps. 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 high water table qualify as prime farmland only in areas where this limitation has been overcome by drainage measures. The need for these measures is indicated in parentheses after the map unit name in the following list. Onsite evaluation is necessary to determine whether or not this limitation has been overcome by corrective measures.

The soils identified as prime farmland in Halifax County are:

AaA	Altavista fine sandy loam, 0 to 3 percent slopes, rarely flooded
AyA	Aycock silt loam, 0 to 3 percent slopes
ChA	Chewacla loam, 0 to 1 percent slopes, occasionally flooded (where drained)
DgA	Dogue silt loam, 0 to 3 percent slopes
DoA	Dothan loamy sand, 0 to 2 percent slopes
DoB	Dothan loamy sand, 2 to 6 percent slopes
EmA	Emporia fine sandy loam, 0 to 2 percent slopes
EmB	Emporia fine sandy loam, 2 to 6 percent slopes
EwB	Emporia-Wedowee complex, 2 to 6 percent slopes
ExA	Exum silt loam, 0 to 2 percent slopes
GoA	Goldsboro fine sandy loam, 0 to 2 percent slopes
GrA	Grantham loam, 0 to 1 percent slopes (where drained)
GtB	Gritney fine sandy loam, 2 to 6 percent slopes
HeA	Helena sandy loam, 0 to 3 percent slopes
HrB	Herndon silt loam, 2 to 6 percent slopes
LyA	Lynchburg fine sandy loam, 0 to 2 percent slopes (where drained)

MrA	Marlboro fine sandy loam, 0 to 2 percent slopes
MrB	Marlboro fine sandy loam, 2 to 6 percent slopes
NaA	Nahunta silt loam, 0 to 2 percent slopes (where drained)
NkB	Nankin gravelly loamy sand, 1 to 6 percent slopes
NoA	Noboco fine sandy loam, 0 to 2 percent slopes
PaB	Pacolet sandy loam, 2 to 6 percent slopes
PeB2	Pacolet sandy clay loam, 2 to 6 percent slopes, eroded
RaA	Rains fine sandy loam, 0 to 1 percent slopes (where drained)
RmA	Riverview loam, 0 to 1 percent slopes, occasionally flooded
StA	State fine sandy loam, 0 to 2 percent slopes
StB	State fine sandy loam, 2 to 6 percent slopes
TmB2	Tatum silty clay loam, 2 to 6 percent slopes, eroded
TtA	Tomotley fine sandy loam, 0 to 2 percent slopes, rarely flooded (where drained)
TuB	Turbeville fine sandy loam, 2 to 6 percent slopes
WeB	Wedowee sandy loam, 2 to 6 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 prevent construction failures caused by unfavorable soil properties.

Generally, the soils in Halifax County that are well suited to crops also are 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

J. Wayne Short, district conservationist, and Bobby G. Brock, conservation agronomist, Natural Resources Conservation Service, helped prepare this section.

In 1992, according to North Carolina Agricultural Statistics, Halifax County had about 105,700 acres of cropland and 19,000 acres of pasture and hayland. Cotton was grown on about 39,400 acres, peanuts on 25,470 acres, corn on 18,800 acres, soybeans on 13,400 acres, small grain on 12,500 acres, tobacco on 3,120 acres, and sorghum on 550 acres *(7)*. The remaining acreage is idle land or is part of the conservation reserve program. Almost all of the pasture and hayland is planted to tall fescue.

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 Natural Resources 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 Natural Resources Conservation Service or the North Carolina Cooperative Extension Service.

Cropland Management

Soil erosion is a hazard affecting cropland and pasture on soils that have slopes of more than 2 percent, such as Emporia, Gritney, Marlboro, Herndon, Pacolet, State, Tatum, Turbeville, and Wedowee soils. Bojac, Bonneau, Dothan, Fuquay, Seabrook, and Tarboro soils are subject to soil blowing.

The economic production of crops needs to include protecting soil from erosion so that future production is sustainable. Erosion is damaging for various reasons. As topsoil is lost, soil productivity and tilth are reduced. Costly and potentially harmful pesticides, fertilizers, and lime are removed from the field in addition to the

valuable topsoil and organic matter. Erosion degrades water quality by increasing the amount of sediments and attached pollutants deposited in streams, lakes, and reservoirs. Effectively controlling erosion helps to maintain soil productivity and improve water quality.

The uncontrolled runoff of water is the primary cause of soil erosion in Halifax County. For many soils, a lack of available water is the main factor limiting crop yields. The quantity of roots in the soil and soil texture greatly influence the amount of water a soil can hold. Proper resource management systems can reduce soil loss and conserve moisture.

Resource management systems provide a protective surface cover, help to control runoff, and increase the rate of water infiltration. Maintaining a plant cover for an extended period of time helps to limit the amount of soil lost through erosion. A conservation cropping system that includes a substantial plant cover should be implemented. A plant cover can be provided by crop residue, cover crops, or grasses grown in rotation.

Conservation tillage includes planting crops in a cover of mulch and disturbing the surface as little as possible. It is recommended for any soil, especially for soils that have an erosion problem. The sustained practice of no-till farming that keeps ground cover on 80 percent or more of the surface can improve the physical, chemical, and biological properties of the soil (fig. 8).

Terraces and diversions help to control erosion by intercepting the excess runoff of surface water and safely diverting it to suitable outlets. Grassed waterways, which are generally planted to tall fescue, safely dispose of the water runoff. Field borders consisting of fescue help to filter sediments from water runoff. These measures are practical and highly effective on soils that have a uniform slope pattern, such as Bonneau, Dothan, Emporia, Fuquay, Gritney, Herndon, Marlboro, Pacolet, State, Tatum, Turbeville, and Wedowee soils. Contour tillage is an effective conservation measure on the sloping soils in Halifax County when it is used with terraces and diversions.

In several of the soils in Halifax County, a compacted plowpan can form between the topsoil and the subsoil. The formation of a plowpan is affected by the amount of traffic across the field and the amount of tillage performed during wet periods. Plowpans commonly occur in Aycock, Bojac, Bonneau, Dothan, Exum, Fuquay, Goldsboro, Lignum, Lynchburg, Noboco, and Nahunta soils. They reduce infiltration, root penetration, and permeability. The hazard of erosion is increased on sloping soils that have plowpans. A conservation tillage system that includes using rippers, subsoilers, and chisels and planting deep-rooted grasses and legumes in rotation can effectively overcome the problem of pans.

Soil blowing is commonly a hazard on soils that have a sandy surface layer. Many tons of topsoil are lost annually from Bojac, Bonneau, Dothan, Fuquay, Seabrook, and Tarboro soils. The windblown material is carried into drainage ditches, generally during March, April, and May. Young plants are the most damaged by the windblown soil particles. Damage from soil blowing can be greatly minimized by using a conservation cropping system that includes cover crops, crop residue management, close-growing crops, and conservation tillage. Establishing windbreaks of tall-growing species of small grain can help to reduce the damage to young row crops caused by the wind. Windbreaks are effective in large, open areas.

Soil tilth is an important factor in crop production. It influences the germination of seeds and water infiltration. Soils that have good tilth have a granular and porous surface layer. Organic matter promotes the development of desirable soil structure. Conservation tillage, crop residue management, stripcropping, cover crops, and grass-based rotations slightly increase the content of organic matter in soil. The sustained practice of no-till farming that maintains a significant ground cover can also increase the content of organic matter.

Most of the soils in Halifax County have a surface layer that is fine sandy loam, silt loam, or loam and has a low content of organic matter. Most of the soils are subject to the formation of a surface crust after rainfall. Soils that have a fine textured surface layer, such as Aycock, Bethera, Chewacla, Dogue, Exum, Grantham, Herndon, Lignum, Nahunta, Riverview, Roanoke, Tatum, and Wahee soils, are especially susceptible. Gritney, Pacolet, and Tatum soils are more sloping and may have an eroded surface layer, which also tends to crust. Additions of crop residue, manure, or mulch and conservation tillage help to prevent crusting and improve soil structure and tilth.

Fall plowing is not recommended in Halifax County because a hard crust forms on most of the soils after intense rains in fall. This crust slows the rate of water infiltration, greatly increases runoff and erosion during winter, and exposes the soil to soil blowing in spring. A protective cover of crop residue helps to prevent erosion.

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

Figure 8.—No-till cotton on Gritney fine sandy loam, 2 to 6 percent slopes, helps to control soil erosion and improve soil properties.

Drainage

Wetness is a management concern on about 30,000 acres in Halifax County that were formerly wetlands and are currently cultivated. The poorly drained and somewhat poorly drained Bethera, Chewacla, Grantham, Lynchburg, Nahunta, Rains, Roanoke, Tomotley, and Wahee soils require drainage systems that include tile drainage and land smoothing. Land smoothing is needed for the successful production of crops, such as corn, soybeans, and small grain. The loamy Chewacla, Rains, Lynchburg, and Tomotley soils respond well to tile drainage. Peanuts and tobacco can be grown if an adequate system of surface and subsurface drainage is installed and maintained. Most of the wet soils in the county

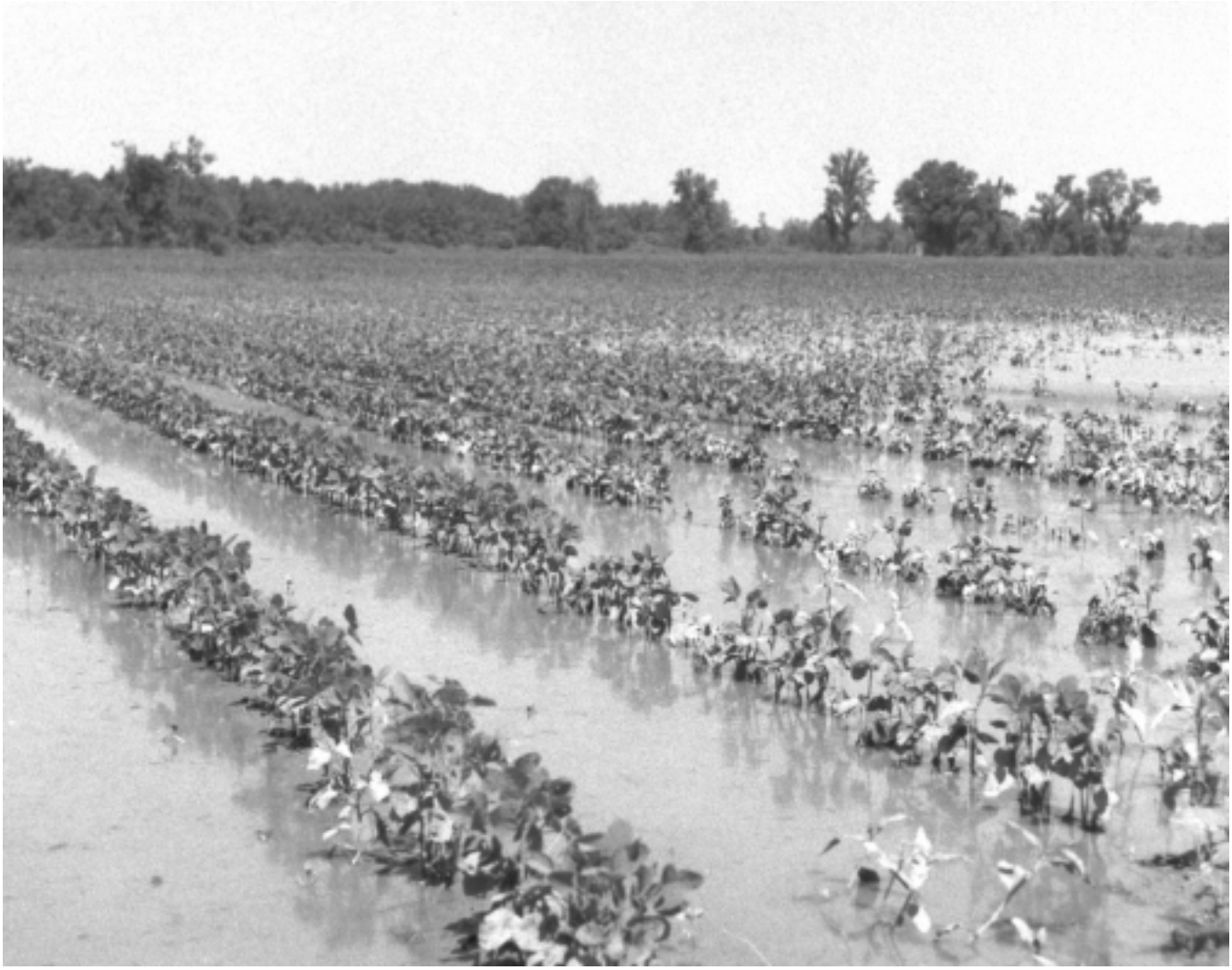

Figure 9.—Wetness is a major limitation affecting crop production in this area of Lynchburg fine sandy loam, 0 to 2 percent slopes.

respond well to artificial drainage, but the clayey Bethera, Roanoke, and Wahee soils and the silty Grantham and Nahunta soils respond slowly. The less responsive soils require an extensive surface drainage system that includes drains installed closer to each other, open channels, and land grading.

Unless artificially drained, the poorly drained and somewhat poorly drained Bethera, Chewacla, Grantham, Lynchburg, Nahunta, Rains, Roanoke, Tomotley, and Wahee soils remain wet until late spring (fig. 9). If these soils are plowed when wet, clods form when the soils dry and preparing a good seedbed is difficult.

Federal and State regulations require that any area designated as wetlands cannot be altered without prior approval. Contact the local office of the Natural Resources Conservation Service for identification of hydric soils and potential wetlands.

Flooding is a problem on several soils that are used for cropland or pasture. Chewacla and Riverview soils are on flood plains and are occasionally flooded. Roanoke soils are on terraces and are occasionally flooded. Altavista, Seabrook, Tomotley, and Wahee soils are on terraces and are rarely flooded. Flooding may occur more often along Fishing Creek, which can rise quickly if the upper watershed has received intense rainfall. The flooding is usually brief, lasting 1 to 5 days. Flooding is less common along the Roanoke River because of the two reservoirs, Gaston Lake and Roanoke Rapids Lake. It tends to be of longer duration, however, along the Roanoke River because extensive amounts of water are released from the

reservoirs over a period of several weeks in order to maintain lake levels. Flooding along the Roanoke River has destroyed crops during the growing season. Crop production can be improved by providing artificial drainage, such as open ditches or subsurface drainage tile, that can remove excess surface and subsurface water.

Soil Fertility

The soils in Halifax County do not have high enough levels of natural fertility to economically produce crops. Economic yields require additions of plant nutrients and lime according to the recommendations of soil tests.

The soils in the county are naturally acid, and additions of lime are needed for most 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 adds calcium (from calcitic lime) or calcium and magnesium (from dolomitic lime). Lime neutralizes exchangeable aluminum and thus counteracts the adverse effects that high levels of aluminum can have on many of the important crops grown in the county.

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 is generally 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.

Chemical Weed Control

The use of herbicides for weed control is a common practice on the cropland in Halifax 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 the content of organic matter 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 may 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 or land smoothing. Current soil tests should be used for specific organic matter determinations. On sandy soils that have less than 2 percent organic matter, the rapid leaching of herbicides can damage young plants or prevent the normal germination of seeds. Herbicide labels show specific application rates based on the content of organic matter and texture of the surface layer.

Pasture Management

Although tall fescue is the major grass grown for pasture and hayland in Halifax County, other species of grass, such as hybrid bermudagrass, common bermudagrass, switchgrass, gamagrass, bluestems, and bahiagrass, are better adapted to summer weather. Some of the native warm-season grasses thrive on all soils, except the very wettest. Livestock producers should plant the species that is best adapted to the specific soil in areas of pasture and hayland. Planting adapted species and using good management techniques, such as soil fertility tests, proper annual fertilization, weed control, and rotational grazing, can produce higher yields from pasture and hayland.

The very deep and deep, well drained and moderately well drained Altavista, Aycock, Dogue, Emporia, Exum, Goldsboro, Gritney, Helena, Herndon, Marlboro, Nankin, Noboco, Pacolet, Riverview, State, Tatum, Turbeville, and Wedowee soils are suited to all of the major grasses commonly grown in the survey area. On these soils, fescue, mixtures of fescue and clover, common bermudagrass, and bahiagrass produce 6 to 9 animal unit months of grazing each year and hybrid bermudagrass produces an average of 10 animal unit months of grazing each year. An animal unit month is the amount of feed or forage required by an animal unit for one month.

The very deep, sandy Bojac, Bonneau, Dothan, Fuquay, Seabrook, and Tarboro soils have moisture limitations and are subject to the leaching of fertilizer. They are not well suited to fescue. These soils are best suited to warm-season grasses. These grasses produce 5 to 9 animal unit months of grazing each year.

If adequately drained, the very deep, wet Bethera,

Chewacla, Grantham, Lynchburg, Nahunta, Rains, Roanoke, Tomotley, and Wahee soils are best suited to fescue or a mixture of fescue and legumes. These plants produce 5 to 9 animal unit months of grazing each year.

An effective management program for pasture and hayland includes summer grasses, such as bermudagrass and switchgrass; cool-season grasses, such as fescue; and grass-legume mixtures. Proper fencing for rotation grazing and an intensive management program for fertilization can help to produce pasture that is available for grazing from March through December.

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 yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and the 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 only 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, such as Bojac, Bonneau, Dothan, Fuquay, Seabrook, and Tarboro soils, applications may be needed on these soils more than once during the growing season.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and the crops, that good-quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

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 Natural Resources 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 *(9)*. 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,* or *s* 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); and *s* shows that the soil is limited mainly because it is shallow or droughty.

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* or *s*.

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

Albert B. Coffey, forester, Natural Resources Conservation Service, helped prepare this section.

Owners of woodland in Halifax County have many objectives. These objectives include producing timber; conserving wildlife, soil, and water; preserving aesthetic values; 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.

For purposes of forest inventory, the predominant forest types identified in Halifax County are as described in the following paragraphs *(12)*.

Loblolly-shortleaf. This forest type covers 103,600 acres. It is predominantly loblolly pine, shortleaf pine, or other kinds of southern yellow pine (excluding longleaf pine and slash pine) or a combination of these species. Commonly included trees are oak, hickory, and gum.

Oak-pine. This forest type covers 46,860 acres. It is predominantly hardwoods, usually upland oaks. Pine species make up 25 to 50 percent of the stand. Commonly included trees are gum, hickory, and yellow-poplar.

Oak-hickory. This forest type covers 77,193 acres. It is predominantly upland oaks or hickory, or both. Commonly included trees are yellow-poplar, elm, maple, and black walnut.

Oak-gum-cypress. This forest type covers 49,221 acres. It is bottom-land forest consisting predominantly of tupelo, blackgum, sweetgum, oaks, southern cypress, or a combination of these species. Commonly included trees are cottonwood, willow, ash, elm, hackberry, and maple.

Elm-ash-cottonwood. This forest type covers 2,778 acres. It is predominantly elm, ash, cottonwood, or a combination of these species. Commonly included trees are willow, sycamore, beech, and maple.

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. Although timber crops require decades to grow, the goal of intensive management is similar to the goal of intensive agriculture. The goal is to produce the greatest yield of the most valuable crop as quickly as possible.

Commercial forests cover about 250,000 acres, or about 54 percent of the land area of Halifax County *(12)*. 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 (fig. 10).

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

Figure 10.—A well managed stand of loblolly pine on Exum silt loam, 0 to 2 percent slopes.

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. The amount of rainfall and length of 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. 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 restrictions or limitations affecting forest use and management. If a soil has more than one limitation, the priority is as follows: R, W, C, and S.

Ratings of *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, 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 the use of equipment 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 the use of equipment 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 the use of equipment 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 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 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 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, and installing a surface drainage system. Reinforcement planting is often needed if the risk is moderate or severe.

Ratings of *windthrow hazard* indicate the likelihood that trees will be uprooted by the wind. A restricted rooting depth is the main reason for windthrow. The rooting depth can be restricted by a high water table, a fragipan, or bedrock or by a combination of such factors as soil wetness, texture, structure, and depth. The risk is *slight* if strong winds break trees but do not uproot them; *moderate* if strong winds blow a few trees over and break many trees; and *severe* if moderate or strong winds commonly blow trees over. Ratings of

moderate or severe indicate that care is needed in thinning or that the stand should not be thinned at all. Special equipment may be needed to prevent damage to shallow root systems in partial cutting operations. A plan for the periodic removal of windthrown trees and the maintenance of a road and trail system may be needed.

The *potential productivity* of *common trees* on a soil is expressed as a *site index* and a *volume* number. Common trees are listed in table 6 in the order of their observed occurrence. 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 estimates of the productivity of the soils in this survey are based mainly on loblolly pine and sweetgum *(4, 6)*.

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. The 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.

Recreation

The rural environment of Halifax County combined with a network of major highways and an interstate provide access to numerous historic sites and many recreational areas. Because the county is located on both the Coastal Plain and the Piedmont, it offers a variety of scenery and wildlife habitats, ranging from the swamps in the eastern part of the county to the upland ridges in the western part.

Hunting and fishing are popular outdoor activities in the county. Currently, the county has hunting seasons for whitetail deer, rabbit, quail, dove, squirrel, duck, and turkey. There is an annual bass fishing tournament at Lake Gaston. Rockfish, bream, crappie, perch, and catfish are other species inhabiting Lake Gaston, the Roanoke River, Fishing Creek, Little Fishing Creek, and other streams in the county.

Camp sites and hiking trails are available in the county. Medoc Mountain State Park is in the southwestern part of the county, near Hollister. Originally a vineyard, the park was established in the early 1970's. Medoc Mountain is not a mountain but a granitic formation that has resisted the erosional forces that created the surrounding landscape. The park covers 2,300 acres and is bisected by Little Fishing Creek. It operates year-round and offers opportunities for hiking, picnicking, camping, canoeing, and fishing. The Roanoke Canal Trail is a 3-mile-long hiking trail along the banks of the Roanoke River. The canal, which extends from Roanoke Rapids to Weldon, was originally built to enable ships to bypass the rapids on the Roanoke River.

Lake Gaston, located in the northwestern part of the county, offers numerous opportunities for water activities, including swimming, boating, waterskiing, and fishing. The lake is 20,300 acres in size and has 350 miles of shoreline. It is manmade and fed by the Roanoke River. Residential areas have private access to the lake, but camping and rental properties also are available. State-operated boat ramps and several marinas provide public boat launches.

The town of Halifax is a State historic site. Numerous old homes and buildings have been restored and are located in a village setting. The town includes a visitors' center and several antique and craft stores.

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 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 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 period of use. The surface 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.

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. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

John P. Edwards, biologist, Natural Resources Conservation Service, helped prepare this section.

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.

The landscapes in the survey area were formed by natural forces, such as the receding of oceans, the cutting of channels by rivers and streams, erosion, sedimentation, and deposition. Through the natural processes of soil formation and development, four distinct landforms, or regions, in Halifax County can be described. These regions include the Piedmont, the Coastal Plain, river and stream terraces, and flood plains. Each region is characterized by particular soils. The soils produce a wide variety of plants. The plants provide cover, food, and protection for wildlife.

Although plants, soils, and wildlife have an indirect relationship, soils and wildlife have a direct relationship because of human activities. Logging activities, agriculture, and housing development impact all species of wildlife. Changes in land use and management can greatly impact populations of wildlife. Depending on the species, these changes can have a positive, neutral, or negative effect. For example, if a forested area is clear cut, certain wildlife species, especially canopy birds, are negatively affected. This type of logging, however, generally has a positive effect on early successional species, such as sparrows, cotton rats, quail, and cottontail rabbit.

The Piedmont region covers about 136,776 acres. The well drained, clayey Pacolet, Herndon, Tatum, and Wedowee soils are the dominant soils. Pacolet and Wedowee soils are derived from granitic rocks, and Herndon and Tatum soils are derived from finer grained slate rocks. These soils are on gently sloping to moderately steep landscapes. The region borders Lake Gaston and Roanoke Rapids Lake to the north and Fishing Creek to the south and is west of North Carolina Highway 48. Individual farms are scattered throughout this area, but much of the cropland and pasture has been abandoned and is regenerating naturally or is replanted to loblolly pine. Red oak, white oak, hickory, dogwood, sourwood, and muscadine grape are dominant on the steeper slopes. This region is primarily used as woodland habitat. Wildlife species

attracted to this area are songbirds, woodpeckers, whitetail deer, gray squirrel, gray fox, rabbit, and raccoon. Lake Gaston has limited value as wildlife habitat because it is heavily used for recreational purposes.

The Coastal Plain region covers about 219,050 acres. Emporia, Goldsboro, Gritney, and Rains soils are the dominant soils. The well drained Emporia, moderately well drained Goldsboro, and poorly drained Rains soils are derived from loamy, coastal plain sediments. The moderately well drained Gritney soils are derived from clayey, coastal plain sediments. Landscapes range from nearly level to moderately sloping. South of Tillery and southeast of Scotland Neck, large areas of the moderately well drained Exum and poorly drained Grantham soils are dominant. These soils are on nearly level landscapes, are derived from loamy, coastal plain sediments, and have a high content of silt. The Coastal Plain region includes the Fall Line. It is bordered by North Carolina Highway 48 to the west, by the Roanoke River to the north, by Fishing Creek to the south, and by the river and stream terraces to the east. The Coastal Plain region is primarily agricultural. It is dissected by numerous streams and broad flood plains. Because fields commonly are more than 200 acres in size, the amount of edge habitat available for wildlife is limited. Fields commonly are plowed to the edge of flood plains and slopes. As a result, buffer strips used for feeding and nesting are not available. Populations of turkey and bear cannot thrive in this region because of agricultural practices and human activities, but many other species of woodland, wetland, and openland wildlife are abundant.

The region of terraces covers about 74,800 acres. It occurs along the Roanoke River and Fishing Creek but is separated from the rivers by the region of flood plains. This region is bordered by the Coastal Plain region to the west. It is characterized by broad, nearly level and gently sloping ridges and broad, smooth, nearly level flats and depressions. State, Tomotley, and Roanoke soils are the dominant soils. The well drained State and poorly drained Tomotley soils formed from loamy fluvial sediments. The poorly drained Roanoke soils are derived from clayey fluvial sediments. State soils are mainly used for agriculture and the production of loblolly pine, but good stands of mast-producing hardwoods, such as red oak, white oak, hickory, beech, dogwood, and red maple, are scattered throughout the mapped areas. Tomotley and Roanoke soils, where not cleared for agriculture, produce loblolly pine, sweetgum, American holly, and greenbrier. This region has an abundance of openland, woodland, and wetland wildlife because it has a diverse landscape that offers a wide variety of habitat adjacent to the flood plains. Deer, turkey, and bear use areas of this region for feeding in late evening and early morning. An edge habitat occurs where wetter soils finger into State soils. It provides food and cover for whitetail deer, quail, and cottontail rabbit.

The region of flood plains covers about 37,400 acres. It occurs along the first bottoms of the Roanoke River, Fishing Creek, Deep Creek, Beech Swamp, and Marsh Swamp. This region is bordered by the terraces to the east and occurs along major creeks and streams throughout the Coastal Plain. Bibb, Chastain, Chewacla, Riverview, and Wehadkee soils are the dominant soils. They are derived from fluvial sediments. The somewhat poorly drained Chewacla and well drained Riverview soils are loamy and occur in broad, nearly level areas. The poorly drained Bibb, Chastain, and Wehadkee soils are in depressional areas. Bibb and Wehadkee soils are loamy, and Chastain soils are clayey. Large stands of mixed hardwoods, red oak, white oak, hickory, red maple, beech, tulip poplar, dogwood, and loblolly pine grow well on Chewacla and Riverview soils. Tupelo and cypress grow better on the wetter, frequently flooded Bibb, Chastain, and Wehadkee soils (fig. 11). This region supports species of woodland and wetland wildlife, such as turkey, bear, whitetail deer, beaver, mink, muskrat, and ducks. Populations of turkey and bear thrive in this region because it has little development. Large, relatively open tracts of mast-bearing trees and scattered stands of mature loblolly pine are used for roosting and hibernating. Populations of wood ducks also thrive because tupelo and cypress provide excellent sites for nesting and brooding.

By dividing Halifax County into four broad regions, it is possible to indicate the location of the largest populations of wildlife, their distribution, and the elements that affect their growth. Creating habitat is necessary for successfully managing wildlife. The placement of field borders, food strips, no-till farming, and the vegetative management of waterways and drainage ditches are essential for good openland wildlife. Management for woodland wildlife includes habitat preservation, selective cutting or thinning of mast-producing trees, reforestation programs, prescribed burning, and the seeding of logging decks and roads with such wildlife plants as bahiagrass, VA-70 lespedeza, Korean lespedeza, Kobe lespedeza, and autumn-olive. Management for wetland wildlife includes habitat preservation, the placement of ponds, and the use of 3-log drainage systems for the management of beaver ponds.

The Natural Resources Conservation Service can provide more information on measures used to

Figure 11.—An area of cypress trees on Chastain and Bibb soils, 0 to 1 percent slopes, frequently flooded, that provides excellent wildlife habitat.

increase wildlife populations while leaving large tracts of land in cultivation. It can assist landowners in developing a wildlife management plan. Soils information and interpretations are important in making proper land use decisions.

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 also are 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 also are 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, and pokeberry.

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 hardwoods 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 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, cattail, rushes, reeds, and sedges.

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 quail, meadowlark, field sparrow, mourning dove, groundhog, whitetail deer, 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, songbirds, gray squirrel, gray fox, raccoon, whitetail deer, and black bear.

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 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, the 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, soil texture, and slope. The time of the year that excavations can be made is affected by the depth to a 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, and shrinking and swelling can cause the movement of footings. Depth to a high water table, depth to bedrock, 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, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), the 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, 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, to use can be obtained from the office of the Fishing Creek 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. Bedrock interferes with installation.

Unsatisfactory performance of septic tank absorption 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 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.

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, 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 and soil reaction affect trench 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. 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 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 the 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. The depth to a high 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 as much as 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 slate 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 high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its content of organic matter. 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 and for embankments, dikes, and levees. 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, organic matter, mica, or salts or sodium. The depth to a high water table affects the amount of usable material. It also affects trafficability.

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, slope, and the hazard of cutbanks caving. Availability of drainage outlets is not considered in the ratings.

Federal and State regulations require that any area designated as wetlands cannot be altered without prior approval. Contact the local office of the Natural Resources Conservation Service for identification of hydric soils and potential wetlands.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to a high water table, the need for drainage, flooding, available water capacity, intake rate, permeability, hazard of erosion, and slope. The performance of a system is affected by the availability of suitable irrigation water, the depth of the root zone, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to help 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, a 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 *(11)*. 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.

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 *(3)* and the system adopted by the American Association of State Highway and Transportation Officials *(2)*.

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 content of organic matter. Sandy and gravelly soils are identified as SW, SP, SM, SC, GW, GP, GM, and GC; 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.

Rock fragments 3 to 10 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 in 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 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 $^1/_3$-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 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.

The 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.

If a soil listed in table 15 is 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

tides. Shallow water standing or flowing for short periods after rainfall 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.

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 content of organic matter 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. Indicated in table 15 are the depth to the 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.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

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 also is expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and the amount of sulfates in the saturation extract.

Formation of the Soils

This section describes the factors of soil formation and relates them to the soils in the survey area.

Factors of Soil Formation

Soils are formed by processes of the environment acting upon geologic materials, such as metamorphic, igneous, and sedimentary rocks and fluvial stream sediments. The characteristics of a soil are determined by the combined influence of parent material, climate, plant and animal life, relief, and time. These five factors are responsible for the profile development and chemical properties that differentiate soils *(5)*.

Parent Material

Parent material is the raw material acted on by soil-forming processes. It largely determines soil texture, which affects other soil properties, such as natural soil drainage and permeability. The physical and chemical composition of parent material has an important effect on the kind of soil that forms.

Many of the differences among the soils of Halifax County indicate differences in parent material. Many of the soils formed in coastal plain sediments, which were deposited by the ocean that covered much of the survey area thousands of years ago. Other soils formed in alluvium or fluvial sediments, which were recently deposited by streams. In the Piedmont region, the soils formed in material that was weathered in place from igneous or metamorphic rocks.

Coastal plain sediments are materials deposited by the ocean and are thus heavily influenced by water action. They typically have particles of various sizes, including sand, silt, and clay, but do not have the larger

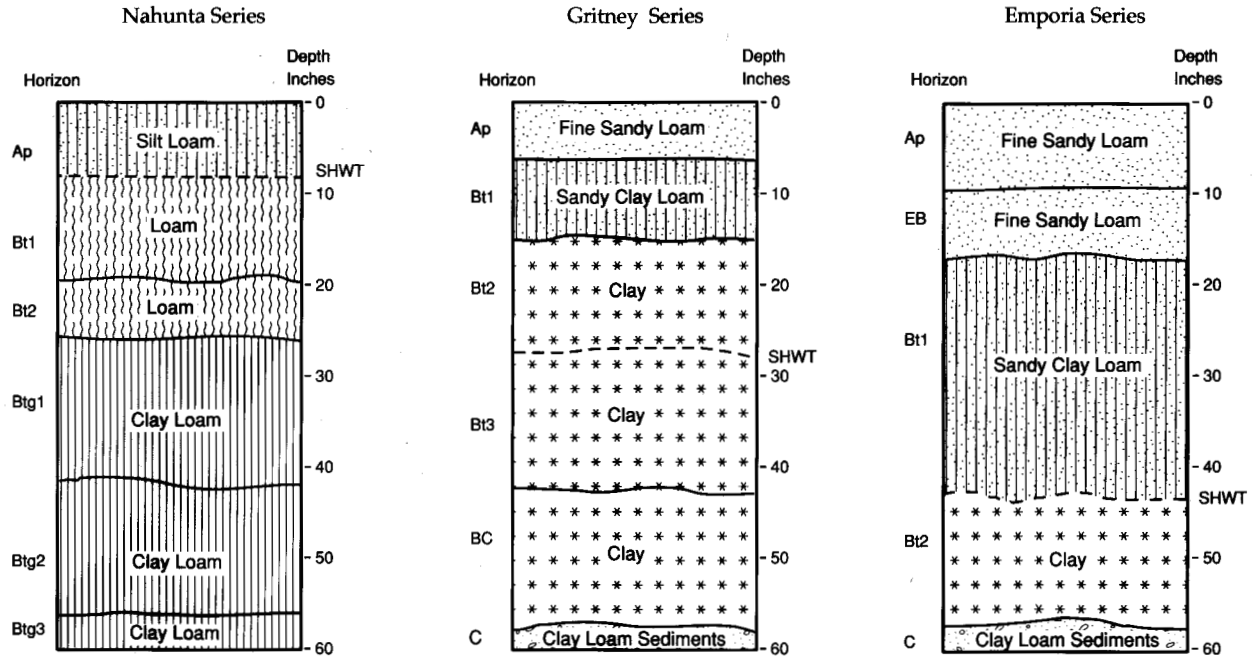

Figure 12.—A comparison of texture and depth to the seasonal high water table for three soils of the Coastal Plain. Nahunta soils are fine-silty and are somewhat poorly drained. Gritney soils are clayey and are moderately well drained. Emporia soils are fine-loamy and are well drained.

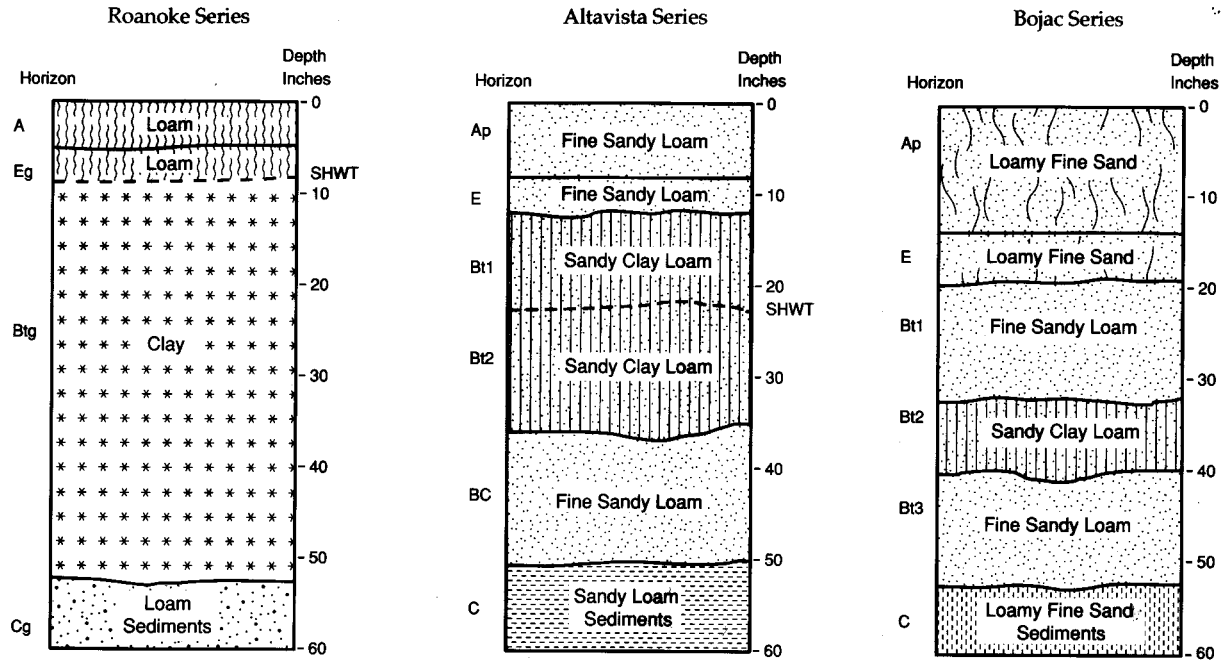

Figure 13.—A comparison of texture and depth to the seasonal high water table for three soils of the terraces. Roanoke soils are clayey and are poorly drained. Altavista soils are fine-loamy and are moderately well drained. Bojac soils are coarse-loamy and are well drained.

rock fragments, such as stones and cobbles. The composition of the sediments depends on the material deposited by the ocean. For example, Emporia and Goldsboro soils formed in loamy, coastal plain sediments that have a high content of sand; Exum and Nahunta soils formed in loamy, coastal plain sediments that have a high content of silt; and Gritney and Marlboro soils formed in clayey, coastal plain sediments (fig. 12).

Recent alluvium or fluvial sediments are soil materials deposited by floodwater along streams and large rivers. The texture of the soil materials varies, depending on the speed of the floodwater, the duration of flooding, and the distance between the materials and the streambank. State, Altavista, Tomotley, and Bojac soils formed in loamy fluvial sediments; Dogue, Wahee, and Roanoke soils formed in clayey fluvial sediments; and Tarboro and Seabrook soils formed in sandy fluvial sediments (fig. 13). Soils that formed in recent alluvium in areas where the hazard of flooding is frequent have weakly expressed horizons because the soil-forming processes are interrupted by each new deposition. These soils also can be highly stratified. The sandy Bibb soils, clayey Chastain soils, and loamy Riverview, Chewacla, and Wehadkee soils formed on active flood plains (fig. 14).

Soils that formed in residuum occur extensively in the western part of Halifax County (fig. 15). Pacolet, Helena, and Wedowee soils formed primarily in saprolite weathered from coarse grained, felsic crystalline rocks, such as porphyritic granite. These soils generally have a loamy surface layer and a clayey subsoil. Tatum, Lignum, and Herndon soils formed in saprolite weathered from fine grained, felsic crystalline rocks, such as Carolina slates. These soils have more silt throughout than the soils weathered from granite.

Climate

Climate, particularly precipitation and temperature, affects soil development. Water is necessary for biological activity. It also dissolves minerals and transports them through the soil profile. Temperature influences the kinds of organisms living in and on the soil and their growth. It also largely determines the speed and extent of chemical and physical reactions in the soil.

Halifax County has a warm, humid climate. This climate promotes the rapid decomposition of organic matter and favors chemical reactions in the soil. The abundant rainfall results in the leaching of soluble bases from the soil and the movement of finer textured mineral particles downward. Therefore, nearly all of the soils in the county are acid, highly weathered, and

highly leached. Variations in climate within the county are slight and generally do not can cause any significant local variation among soils.

Plant and Animal Life

The vegetation under which a soil forms influences soil properties, such as color, structure, reaction, and content and distribution of organic matter. Vegetation extracts water from the soil, recycles nutrients, and adds organic matter to the soil.

Originally, pine forests covered most of the uplands on the Coastal Plain and hardwood forests covered the Piedmont region. Baldcypress, water tupelo, and other hardwoods were dominant on flood plains and along drainageways in the survey area. These trees took up elements from the subsoil and deposited them on the surface. The decay of twigs, trunks, branches, and leaves added organic matter to the surface layer.

The length of time that organic matter remains in the soil largely depends upon soil drainage. In the well drained Emporia and Bonneau soils, organic matter is oxidized at such a rapid rate that very little organic matter accumulates on the surface. The breakdown of organic matter is slower in wet soils, such as Bethera, Grantham, and Rains soils. The wet soils have a dark surface layer that has a relatively high content of organic matter.

Bacteria, fungi, and other relatively simple micro-organisms aid in weathering soil and in decomposing organic matter. Larger plants and animals produce organic matter and translocate elements and material within the soil. The activities of fungi and micro-organisms occur only in the upper few inches of soils in the survey area. Earthworms and other small invertebrates produce a slow but continuous cycle of mixing within this thin surface layer. Rodents have had little effect on the formation of soils in the county.

Relief

Relief influences soil formation mainly through its effect on runoff, erosion, drainage, aeration, and exposure to sun and wind. Soils in Halifax County range from nearly level to steep. Exum, Bonneau, Goldsboro, Marlboro, and other nearly level and gently sloping soils have a profile that is thicker than that of moderately sloping to moderately steep soils, such as Gritney, Wedowee, Tatum, and Winton soils. Relief also largely determines natural drainage and greatly

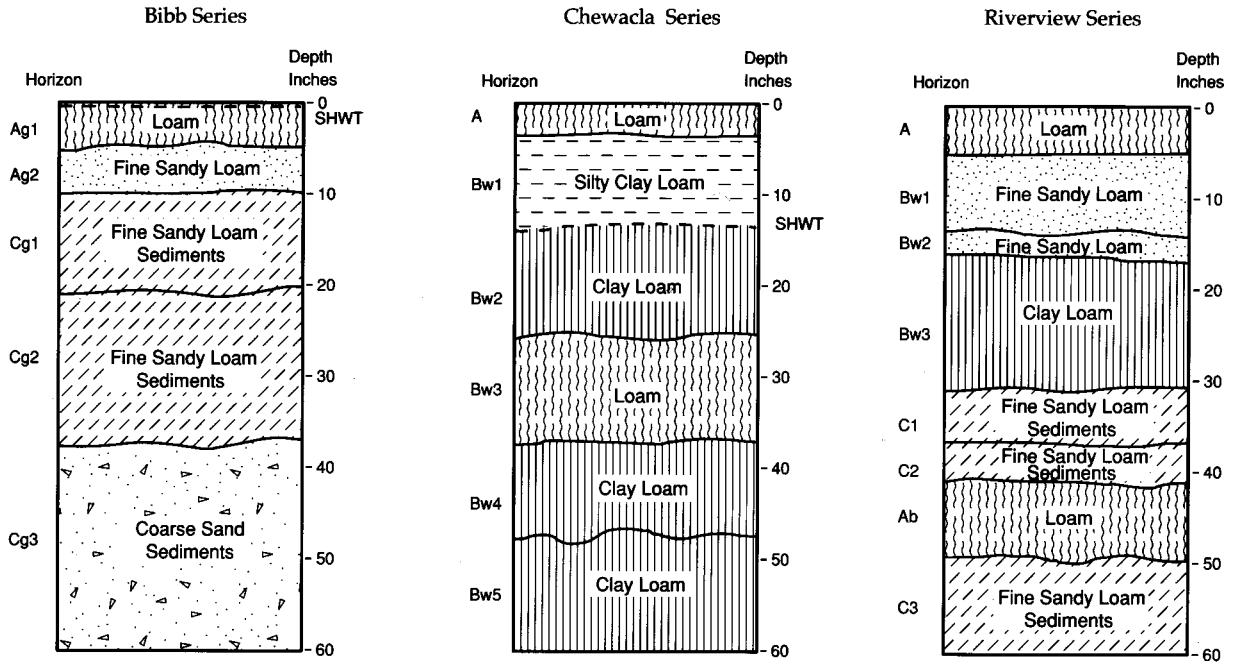

Figure 14.—A comparison of texture and depth to the seasonal high water table for three soils of the flood plains. Bibb soils are coarse-loamy and are poorly drained. Chewacla soils are fine-loamy and are somewhat poorly drained. Riverview soils are fine-loamy and are well drained.

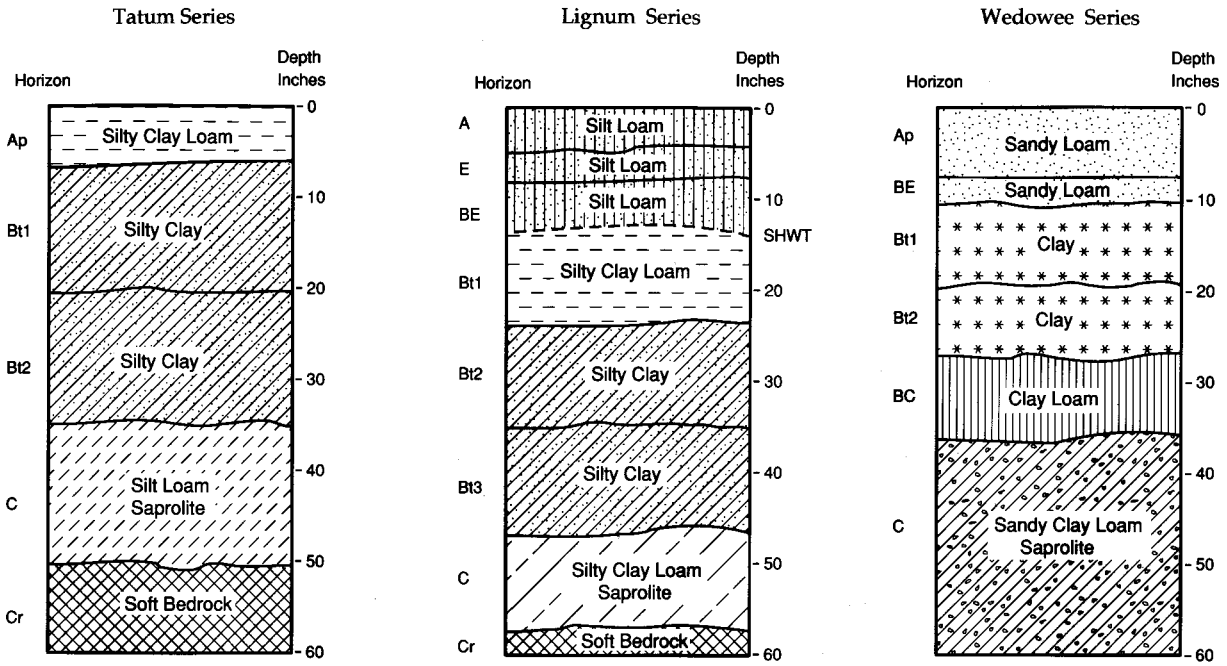

Figure 15.—A comparison of texture and depth to the seasonal high water table for three soils of the Piedmont. Tatum soils are deep to soft bedrock and are well drained. Lignum soils are also deep to soft bedrock and are moderately well drained. Wedowee soils are very deep to bedrock and are well drained.

influences the accumulation of organic matter in the soil.

Time

The length of time that soil material has been exposed to the soil-forming processes influences the nature of the soil that forms. A sequence of horizons requires a long time to develop in a natural soil. Horizons are more strongly developed in older soils than in younger soils.

Noboco, Fuquay, and Goldsboro soils are some of the oldest soils in Halifax County. They formed on nearly level, broad, smooth, upland ridges and flats. These soils have well developed horizons. They formed in coastal plain sediments on landscapes that have remained essentially unchanged for thousands of years.

Wedowee and Tatum soils are soils of intermediate age in the county. They formed on gently sloping to steep upland ridges and side slopes. These soils formed in highly weathered saprolite. They have well developed horizons but have a subsoil that is thinner than that of the older soils.

The youngest soils in the county include Bibb, Chastain, Chewacla, and Wehadkee soils. They formed in recent alluvium. These soils can be stratified and have weakly expressed horizons because the soil-forming processes are interrupted by new depositions of material.

Processes of Horizon Differentiation

The formation of a succession of layers, or horizons, in soil is the result of one or more of the soil-forming processes. These processes are the accumulation of organic matter; the leaching of carbonates and other soluble material; the chemical weathering, mainly by hydrolysis, of primary minerals into silicate clay minerals; the translocation of silicate clay and some silt-sized particles from one horizon to another; and the reduction and transfer of iron.

Several of these processes have been active in the formation of most of the soils in Halifax County. The interaction of the first four processes is indicated in the strongly expressed horizons in Turbeville and Noboco soils. All five processes have probably been active in the formation of the moderately well drained Goldsboro and Exum soils.

Some organic matter has accumulated in all of the soils in the survey area. Most of the soils contain moderate amounts of organic matter in the surface layer. The content of organic matter ranges from low, as in Bonneau soils, to high, as in Wehadkee soils.

The translocation of clay minerals is an important process in the development of many soils in the survey area. As clay minerals are removed from the A horizon, they accumulate as clay films on the faces of peds, in pores, and in root channels in the B horizon.

The reduction and transfer of iron have occurred in all of the soils that are not characterized by good natural drainage. This process, known as gleying, is evidenced by a gray matrix color and mottles. Some of the iron may be reoxidized and segregated and thus form yellowish brown, strong brown, or other brightly colored mottles in an essentially gray matrix in the subsoil. Nodules or concretions of iron or manganese also commonly form as a result of this process.

As silicate clay forms from primary minerals, some iron is commonly released as hydrated oxides. These oxides are generally red. Even if they occur in small amounts, they give the soil material a brownish color. They are largely responsible for the strong brown, yellowish brown, or reddish brown colors that are dominant in the subsoil of many soils in the survey area.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(10)*. 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 16 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 horizon development, plus *udult*, the suborder of the Ultisols that occurs in humid climates).

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, siliceous, 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, and mineral and chemical composition and arrangement in the profile. There can be some variation in the texture of the surface layer or of the substratum within a series. The Emporia series is an example of fine-loamy, siliceous, thermic Typic Hapludults in Halifax County.

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. The location of the typical pedon is described, and coordinates are identified by longitude and latitude. The detailed description of each soil horizon follows standards in the “Soil Survey Manual” *(13)*. Many of the technical terms used in the descriptions are defined in “Soil Taxonomy” *(10)*. 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 soils that formed in loamy fluvial sediments. Slopes range from 0 to 3 percent. These soils are fine-loamy, mixed, thermic Aquic Hapludults.

Typical pedon of Altavista fine sandy loam, 0 to 3 percent slopes, rarely flooded; about 2.1 miles northwest of Norfleet on Secondary Road 1800, about 0.5 mile southwest on a farm path, about 500 feet northwest of the farm path, in a field; Norfleet USGS topographic quadrangle; lat. 36 degrees 09 minutes 58 seconds N. and long. 77 degrees 20 minutes 07 seconds W.

Ap—0 to 8 inches; dark brown (7.5YR 4/2) fine sandy loam; weak fine granular structure; very friable; many very fine and fine roots; neutral; abrupt smooth boundary.

E—8 to 12 inches; brownish yellow (10YR 6/8) fine sandy loam; weak fine granular structure; very friable; many fine and few medium roots; slightly acid; clear wavy boundary.

Bt1—12 to 23 inches; strong brown (7.5YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; moderately acid; gradual wavy boundary.

Bt2—23 to 36 inches; strong brown (7.5YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; common medium distinct gray (10YR 6/1) iron depletions and few fine distinct red (2.5YR 4/8) masses of iron accumulation; moderately acid; gradual wavy boundary.

BC—36 to 50 inches; reddish yellow (7.5YR 6/8), gray (10YR 6/1), and strong brown (7.5YR 5/8) fine sandy loam; weak coarse subangular blocky structure; very friable; areas with gray and brown colors are iron depletions and areas with yellow colors are iron accumulations; strongly acid; gradual wavy boundary.

C—50 to 62 inches; reddish yellow (7.5YR 6/8), gray (10YR 6/1), and strong brown (7.5YR 5/8) sandy loam with thin strata of sandy clay loam; massive; friable; areas with gray and brown colors are iron depletions and areas with yellow colors are iron accumulations; strongly acid; gradual wavy boundary.

The thickness of the solum ranges from 30 to more than 60 inches. The soils are moderately acid to extremely acid unless limed.

The Ap or A horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 1 to 4.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 8. It is loamy fine sand, fine sandy loam, sandy loam, or loam.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 3 to 8. Iron depletions with chroma of 2 or less are within 30 inches of the surface. Masses of iron accumulation in shades of red, yellow, or brown may occur in the lower part of the horizon. Texture is sandy clay loam, loam, or clay loam.

The BC horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 to 8. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is loamy sand, fine sandy loam, sandy loam, loam, or sandy clay loam.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 3 to 8. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is sand, loamy coarse sand, loamy sand, sandy loam, fine sandy loam, loam, or sandy clay loam.

Aycock Series

The Aycock series consists of well drained soils that formed in loamy sediments on coastal plains. Slopes range from 0 to 3 percent. These soils are fine-silty, siliceous, thermic Typic Paleudults.

Typical pedon of Aycock silt loam, 0 to 3 percent slopes; about 1.7 miles northeast of North Carolina Highway 125 on Secondary Road 1003, about 0.8 mile northwest on a farm path, about 40 feet south of the farm path, in a field; Scotland Neck USGS topographic quadrangle; lat. 36 degrees 11 minutes 52 seconds N. and long. 77 degrees 28 minutes 51 seconds W.

Ap—0 to 6 inches; brown (10YR 5/3) silt loam; weak medium granular structure; very friable; common fine and few medium roots; moderately acid; abrupt smooth boundary.

E—6 to 10 inches; light yellowish brown (2.5Y 6/4) silt loam; moderate medium granular structure; very friable; common fine roots; strongly acid; clear smooth boundary.

Bt1—10 to 26 inches; yellowish brown (10YR 5/6) loam; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; few faint clay films on faces of peds; few fine distinct reddish yellow (7.5YR 6/8) masses of iron accumulation; strongly acid; clear smooth boundary.

Bt2—26 to 42 inches; yellowish brown (10YR 5/6) loam; weak medium subangular blocky structure;

friable; slightly sticky, nonplastic; few faint clay films on faces of peds; few fine distinct reddish yellow (7.5YR 6/8), common medium distinct yellowish red (5YR 5/8), and few fine prominent red (2.5YR 4/8) masses of iron accumulation; strongly acid; clear smooth boundary.

Bt3—42 to 60 inches; yellowish brown (10YR 5/6) loam; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; few faint clay films on faces of peds; few fine distinct gray (10YR 6/1) iron depletions; common medium distinct reddish yellow (7.5YR 6/8) and yellowish red (5YR 5/8) and common medium prominent red (2.5YR 4/8) masses of iron accumulation; strongly acid; clear smooth boundary.

Bt4—60 to 74 inches; strong brown (7.5YR 5/8), yellowish brown (10YR 5/6), red (2.5YR 4/6), and gray (10YR 6/1) clay loam; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; few faint clay films on faces of peds; areas with gray colors are iron depletions and areas with brown and red colors are iron accumulations; strongly acid.

The thickness of the solum is more than 60 inches. The soils are strongly acid or very strongly acid unless limed.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 4 to 6, 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 or 4. It is loam or silt loam.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 4 to 8. Iron depletions in shades of brown or yellow may occur throughout the horizon, except in the upper part. Iron depletions in shades of gray may occur below a depth of 30 inches. Masses of iron accumulation in shades of brown or red may occur throughout the horizon. Texture is loam, silty clay loam, or clay loam.

Bethera Series

The Bethera series consists of poorly drained soils that formed in clayey sediments on coastal plains (fig. 16). Slopes are 0 to 1 percent. These soils are clayey, mixed, thermic Typic Paleaquults.

Typical pedon of Bethera loam, 0 to 1 percent slopes; about 1.0 mile west-northwest of Scotland Neck on North Carolina Highway 903/125, about 0.25 mile north of the road, in a wooded area; Scotland Neck USGS topographic quadrangle; lat. 36 degrees 08 minutes 25 seconds N. and long. 77 degrees 26 minutes 18 seconds W.

A—0 to 7 inches; very dark gray (10YR 3/1) loam; weak medium granular structure; friable; many very fine and fine and common coarse roots; strongly acid; clear wavy boundary.

BEg—7 to 13 inches; light brownish gray (10YR 6/2) silt loam; weak medium subangular blocky structure; friable; slightly sticky, slightly plastic; common fine and few coarse roots; few faint clay films on faces of peds; common medium distinct reddish yellow (7.5YR 6/8) masses of iron accumulation; very strongly acid; clear wavy boundary.

Btg1—13 to 35 inches; gray (10YR 6/1) clay; moderate medium subangular blocky structure; firm; moderately sticky, slightly plastic; few fine roots; common distinct clay films on faces of peds; many medium distinct reddish yellow (7.5YR 6/8) and few fine prominent reddish yellow (5YR 6/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Btg2—35 to 52 inches; gray (10YR 5/1) silty clay; moderate medium subangular blocky structure; very firm; moderately sticky, slightly plastic; few fine roots; common distinct clay films on faces of peds; few fine distinct light yellowish brown (10YR 6/4) and many medium distinct reddish yellow (7.5YR 6/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Btg3—52 to 63 inches; light brownish gray (10YR 6/2) silty clay; weak medium subangular blocky structure; very firm; moderately sticky, slightly plastic; few distinct clay films on faces of peds; few fine faint light gray (2.5Y 7/2) and common fine distinct reddish yellow (7.5YR 6/8) masses of iron accumulation; very strongly acid.

The thickness of the solum is more than 60 inches. The soils are moderately acid to extremely acid unless limed.

The Ap or A horizon has hue of 10YR or 2.5Y or is neutral in hue and has value of 2 to 4 and chroma of 0 to 2.

The Eg horizon, if it occurs, has hue of 10YR to 5Y or is neutral in hue and has value of 4 to 7 and chroma of 0 to 2. It is fine sandy loam, silt loam, or clay loam.

The BEg horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. Masses of iron accumulation in shades of brown, yellow, or red occur in most pedons. Texture is sandy loam, sandy clay loam, loam, or clay loam.

The Btg horizon has hue of 10YR to 5Y or is neutral in hue and has value of 4 to 7 and chroma of 0 to 2. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown

may occur. Texture is clay loam, sandy clay, clay, or silty clay.

Bibb Series

The Bibb series consists of poorly drained soils that formed in sandy fluvial sediments. Slopes are 0 to 1 percent. These soils are coarse-loamy, siliceous, acid, thermic Typic Fluvaquents.

Typical pedon of Bibb loam in an area of Chastain and Bibb soils, 0 to 1 percent slopes, frequently flooded; about 0.9 mile east-southeast of Pierces Crossroads on North Carolina Highway 903, about 800 feet north of the road, in a wooded area; Darlington USGS topographic quadrangle; lat. 36 degrees 21 minutes 19 seconds N. and long. 77 degrees 38 minutes 49 seconds W.

Ag1—0 to 5 inches; dark grayish brown (10YR 4/2) loam; moderate medium granular structure; friable; common fine and medium roots; very strongly acid; abrupt smooth boundary.

Ag2—5 to 10 inches; grayish brown (10YR 5/2) fine sandy loam; weak medium granular structure; friable; common fine and medium roots; very strongly acid; clear wavy boundary.

Cg1—10 to 20 inches; light brownish gray (10YR 6/2) fine sandy loam; massive; friable; common medium and few coarse roots; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation; very strongly acid; clear wavy boundary.

Cg2—20 to 36 inches; gray (10YR 5/1) fine sandy loam; massive; very friable; few medium and coarse roots; very strongly acid; clear wavy boundary.

Cg3—36 to 66 inches; dark gray (10YR 4/1) coarse sand; single grained; loose; very strongly acid.

The soils are strongly acid or very strongly acid unless limed.

The Ag horizon has hue of 10YR or 2.5Y or is neutral in hue and has value of 3 to 7 and chroma of 1 or 2.

The Cg horizon has hue of 10YR to 5Y or is neutral in hue and has value of 3 to 7 and chroma of 1 or 2. Masses of iron accumulation in shades of red, yellow, or brown may occur. The upper part of the horizon generally is sandy loam, fine sandy loam, or loam. Thin strata of coarser textured material may also occur. The lower part of the horizon is coarse sand, sand, loamy sand, loamy fine sand, sandy loam, or fine sandy loam.

Bojac Series

The Bojac series consists of well drained soils that formed in loamy fluvial sediments. Slopes range from 0 to 3 percent. These soils are coarse-loamy, mixed, thermic Typic Hapludults.

Typical pedon of Bojac loamy fine sand, 0 to 3 percent slopes; about 1.9 miles south-southeast of Roseneath on U.S. Highway 258, about 1.2 miles east on a farm path, about 50 feet south of the farm path, in a field; Draughn USGS topographic quadrangle; lat. 36 degrees 02 minutes 38 seconds N. and long. 77 degrees 30 minutes 55 seconds W.

Ap—0 to 12 inches; brown (10YR 4/3) loamy fine sand; single grained; loose; strongly acid; abrupt smooth boundary.

E—12 to 18 inches; brownish yellow (10YR 6/6) loamy fine sand; single grained; loose; strongly acid; clear wavy boundary.

Bt1—18 to 31 inches; strong brown (7.5YR 5/8) fine sandy loam; weak fine subangular blocky structure; very friable; few faint clay bridges between sand grains; very strongly acid; clear smooth boundary.

Bt2—31 to 39 inches; strong brown (7.5YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt3—39 to 53 inches; yellowish brown (10YR 5/8) fine sandy loam; weak coarse subangular blocky structure; very friable; few faint clay bridges between sand grains; very strongly acid; gradual wavy boundary.

C—53 to 74 inches; yellow (2.5Y 7/6) loamy fine sand; single grained; loose; common medium distinct yellow (10YR 7/8) masses of iron accumulation; very strongly acid.

The thickness of the solum ranges from 30 to 65 inches. The soils are moderately acid to very strongly acid unless limed.

The Ap or A horizon has hue of 7.5YR to 2.5Y, value of 3 to 6, and chroma of 1 to 4.

The E horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 4 to 6. It is loamy sand, loamy fine sand, fine sandy loam, sandy loam, or loam.

The Bt horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8. It generally is sandy loam, fine sandy loam, or loam. Thin layers of sandy clay loam or clay loam may also occur.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 3 to 8. Iron depletions with chroma of 2 or less and masses of iron accumulation in

shades of red, yellow, or brown may occur. Texture is gravelly sand, sand, fine sand, or gravelly loamy sand.

Bonneau Series

The Bonneau series consists of well drained soils that formed in loamy sediments on coastal plains (fig. 17). Slopes range from 0 to 4 percent. These soils are loamy, siliceous, thermic Arenic Paleudults.

Typical pedon of Bonneau loamy fine sand, 0 to 4 percent slopes; about 4.6 miles north of Enfield on Secondary Road 1001, about 0.5 mile west on a farm path, about 50 feet south of the farm path, in a field; Enfield USGS topographic quadrangle; lat. 36 degrees 14 minutes 50 seconds N. and long. 77 degrees 40 minutes 03 seconds W.

Ap—0 to 9 inches; dark brown (10YR 4/3) loamy fine sand; moderate medium granular structure; very friable; few fine roots; moderately acid; abrupt smooth boundary.

E—9 to 23 inches; pale brown (10YR 6/3) loamy fine sand; moderate medium granular structure; very friable; moderately acid; clear wavy boundary.

Bt1—23 to 31 inches; yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; common faint clay films on faces of peds; strongly acid; clear wavy boundary.

Bt2—31 to 36 inches; yellowish brown (10YR 5/6) fine sandy loam; moderate medium subangular blocky structure; friable; common distinct clay films on faces of peds; common medium distinct yellowish red (5YR 4/6) and common medium faint light yellowish brown (10YR 6/4) masses of iron accumulation; strongly acid; gradual wavy boundary.

Bt3—36 to 54 inches; strong brown (7.5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; few distinct clay films on faces of peds; common fine distinct gray (10YR 6/1) iron depletions and many medium distinct red (2.5YR 4/6) masses of iron accumulation; strongly acid; gradual wavy boundary.

Bt4—54 to 66 inches; red (2.5YR 4/8), gray (N 6/0), and yellowish brown (10YR 5/6) sandy clay loam; weak coarse subangular blocky structure; friable; few faint clay films on faces of peds; areas with gray colors are iron depletions and areas with red and brown colors are iron accumulations; very strongly acid.

The thickness of the solum is more than 60 inches. The soils are moderately acid to extremely acid unless limed.

The Ap or A horizon has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 1 to 4.

The E horizon has hue of 10YR or 2.5Y, value of 4 to 8, and chroma of 2 to 6. It is sand, fine sand, loamy sand, or loamy fine sand.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 3 to 8 or does not have a dominant matrix color and is in shades of red, yellow, brown, or gray. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur in the lower part of the horizon. Texture is sandy loam, fine sandy loam, sandy clay loam, or sandy clay.

Chastain Series

The Chastain series consists of poorly drained soils that formed in clayey fluvial sediments. Slopes are 0 to 1 percent. These soils are fine, mixed, acid, thermic Typic Fluvaquents.

Typical pedon of Chastain clay loam in an area of Chastain and Bibb soils, 0 to 1 percent slopes, frequently flooded; about 0.8 mile south-southeast of Secondary Road 1003 on Secondary Road 1109, about 0.3 mile east on a farm path, about 0.2 mile southeast on the farm path, about 200 feet southeast of the farm path, in a wooded area; Dawson Crossroads USGS topographic quadrangle; lat. 36 degrees 08 minutes 05 seconds N. and long. 77 degrees 36 minutes 57 seconds W.

Ag—0 to 5 inches; very dark grayish brown (10YR 3/2) clay loam; weak medium subangular blocky structure; friable; many fine, medium, and coarse roots; very strongly acid; clear wavy boundary.

Bg1—5 to 12 inches; grayish brown (10YR 5/2) silty clay; weak medium subangular blocky structure; firm; slightly sticky, nonplastic; many fine, medium, and coarse roots; common medium distinct strong brown (7.5YR 5/8) masses of iron accumulation; very strongly acid; clear wavy boundary.

Bg2—12 to 25 inches; gray (10YR 6/1) clay; weak medium subangular blocky structure; very firm; moderately sticky, slightly plastic; common fine and few medium and coarse roots; common medium distinct strong brown (7.5YR 5/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Bg3—25 to 36 inches; gray (N 6/0) clay; weak medium subangular blocky structure; very firm; moderately sticky, slightly plastic; few coarse and medium roots; many medium distinct strong brown (7.5YR 5/8) and few fine distinct yellowish red (5YR 5/8)

masses of iron accumulation; very strongly acid; gradual wavy boundary.

Bg4—36 to 54 inches; dark gray (N 4/0) clay; weak coarse subangular blocky structure; very firm; moderately sticky, slightly plastic; few fine distinct strong brown (7.5YR 5/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Cg—54 to 72 inches; light brownish gray (10YR 6/2) silty clay; massive; very firm; moderately sticky, slightly plastic; many medium faint dark gray (10YR 4/1) iron depletions and few medium distinct strong brown (7.5YR 5/8) masses of iron accumulation; very strongly acid.

The thickness of the solum ranges from 40 to more than 60 inches. The soils are moderately acid to very strongly acid unless limed.

The A or Ag horizon has hue of 7.5YR to 5Y or is neutral in hue and has value of 4 to 6 and chroma of 0 to 6. Where it has value of 3, the horizon is less than 6 inches thick.

The Bg horizon has hue of 10YR to 5GY or is neutral in hue and has value of 4 to 7 and chroma of 0 to 2. Masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is silty clay loam, clay loam, silty clay, or clay.

The Cg horizon has hue of 10YR to 5GY or is neutral in hue and has value of 4 to 7 and chroma of 0 to 2. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is sandy clay loam, silty clay loam, clay loam, silty clay, or clay.

Chewacla Series

The Chewacla series consists of somewhat poorly drained soils that formed in loamy fluvial sediments. Slopes are 0 to 1 percent. These soils are fine-loamy, mixed, thermic Fluvaquentic Dystrochrepts.

Typical pedon of Chewacla loam, 0 to 1 percent slopes, occasionally flooded; about 1.0 mile east-southeast of Norfleet on Secondary Road 1800, about 1.3 miles east-southeast on a farm path, about 1.0 mile south-southwest on the farm path, about 0.5 mile southeast of the farm path, in a wooded area; Palmyra USGS topographic quadrangle; lat. 36 degrees 06 minutes 56 seconds N. and long. 77 degrees 15 minutes 50 seconds W.

A—0 to 4 inches; dark brown (7.5YR 4/4) loam; weak medium granular structure; friable; common very fine, fine, and medium roots; few fine flakes of mica; very strongly acid; clear smooth boundary.

Bw1—4 to 14 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak medium subangular blocky structure; friable; common fine and medium roots; common fine flakes of mica; few medium faint brown (10YR 5/3) iron depletions; very strongly acid; gradual wavy boundary.

Bw2—14 to 26 inches; dark yellowish brown (10YR 4/4) clay loam; weak medium subangular blocky structure; friable; common fine and medium roots; many fine flakes of mica; common medium faint grayish brown (10YR 5/2) iron depletions and common medium distinct strong brown (7.5YR 4/6) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Bw3—26 to 38 inches; dark brown (7.5YR 4/4) loam; weak medium subangular blocky structure; friable; common fine roots; many fine flakes of mica; common medium distinct gray (10YR 5/1) iron depletions; very strongly acid; gradual wavy boundary.

Bw4—38 to 47 inches; strong brown (7.5YR 5/8) clay loam; weak medium subangular blocky structure; friable; few fine roots; many fine flakes of mica; common medium distinct gray (10YR 5/1) iron depletions; very strongly acid; gradual wavy boundary.

Bw5—47 to 60 inches; gray (10YR 5/1), strong brown (7.5YR 5/8), and red (2.5YR 5/8) clay loam; weak medium subangular blocky structure; friable; few fine roots; many fine flakes of mica; areas with gray colors are iron depletions and areas with red and brown colors are iron accumulations; very strongly acid; gradual wavy boundary.

C—60 to 72 inches; dark brown (7.5YR 4/4) and gray (7.5YR 5/1) loam; massive; friable; many fine flakes of mica; areas with gray colors are iron depletions and areas with brown colors are iron accumulations; very strongly acid.

The thickness of the solum ranges from 15 to more than 60 inches. The soils are slightly acid to very strongly acid unless limed.

The A or Ap horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 1 to 4.

The Bw horizon has hue of 5YR to 2.5Y, value of 4 to 7, and chroma of 3 to 8. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is sandy loam, loam, sandy clay loam, clay loam, silty clay loam, or silt loam.

The Bg horizon, if it occurs, has hue of 10YR or 2.5Y or is neutral in hue and has value of 4 to 7 and chroma of 1 or 2. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of

red, yellow, or brown may occur. Texture is sandy loam, loam, sandy clay loam, clay loam, silty clay loam, or silt loam.

The C or Cg horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 1 to 4. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is loamy sand, loam, sandy loam, or sandy clay loam.

Dogue Series

The Dogue series consists of moderately well drained soils that formed in clayey fluvial sediments. Slopes range from 0 to 3 percent. These soils are clayey, mixed, thermic Aquic Hapludults.

Typical pedon of Dogue silt loam, 0 to 3 percent slopes; about 1.5 miles east of Pender on North Carolina Highway 561, about 0.7 mile south-southwest on a logging road, about 75 feet southeast of the logging road, in a wooded area; Halifax USGS topographic quadrangle; lat. 36 degrees 17 minutes 39 seconds N. and long. 77 degrees 34 minutes 14 seconds W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; very friable; many very fine and fine and common medium roots; strongly acid; clear wavy boundary.

E—4 to 8 inches; light yellowish brown (10YR 6/4) loam; weak fine granular structure; very friable; common very fine and fine and few medium roots; strongly acid; gradual wavy boundary.

BE—8 to 13 inches; yellow (10YR 7/6) loam; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; few fine and medium roots; very strongly acid; gradual wavy boundary.

Bt1—13 to 17 inches; brownish yellow (10YR 6/6) clay loam; weak medium subangular blocky structure; firm; slightly sticky, nonplastic; few faint clay films on faces of peds; few fine flakes of mica; common fine distinct strong brown (7.5YR 5/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Bt2—17 to 31 inches; brownish yellow (10YR 6/6) clay; weak medium subangular blocky structure; firm; slightly sticky, nonplastic; common distinct clay films on faces of peds; few fine flakes of mica; common medium distinct light gray (N 7/0) iron depletions and many medium distinct strong brown (7.5YR 5/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Bt3—31 to 40 inches; brownish yellow (10YR 6/6), strong brown (7.5YR 5/8), and light gray (N 7/0) clay; weak medium subangular blocky structure; firm; slightly sticky, nonplastic; common distinct clay films on faces of peds; few fine flakes of mica; areas with gray colors are iron depletions and areas with brown colors are iron accumulations; very strongly acid; gradual wavy boundary.

BC—40 to 53 inches; strong brown (7.5YR 5/8) and light gray (N 7/0) sandy clay loam that has pockets of sandy clay; weak coarse subangular blocky structure; friable; few faint clay films on faces of peds; few fine flakes of mica; areas with gray colors are iron depletions and areas with brown colors are iron accumulations; very strongly acid; gradual wavy boundary.

C—53 to 62 inches; yellow (10YR 7/6), brownish yellow (10YR 6/6), strong brown (7.5YR 5/8), and light gray (N 7/0) sandy clay loam; massive; very friable; few fine flakes of mica; areas with gray colors are iron depletions and areas with yellow and brown colors are iron accumulations; very strongly acid.

The thickness of the solum ranges from 40 to 60 inches. The soils are strongly acid to extremely acid unless limed.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4.

The E horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 3 to 6. It is sandy loam, fine sandy loam, loam, or silt loam.

The BE or BA horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 4 to 8. It is clay loam, sandy clay loam, or loam.

The upper part of the Bt horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8. The lower part has hue of 7.5YR to 2.5Y or is neutral in hue and has value of 4 to 7 and chroma of 0 to 8. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is sandy clay loam, clay loam, sandy clay, or clay.

The BC horizon has hue of 7.5YR to 2.5Y or is neutral in hue and has value of 4 to 7 and chroma of 3 to 8. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is sandy loam, sandy clay loam, clay loam, or sandy clay.

The C horizon has hue of 7.5YR to 2.5Y or is neutral in hue and has value of 4 to 7 and chroma of 3 to 8. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is loamy sand, sandy loam, or sandy clay loam.

Dothan Series

The Dothan series consists of well drained soils that formed in loamy sediments on coastal plains. Slopes range from 0 to 6 percent. These soils are fine-loamy, siliceous, thermic Plinthic Kandiudults.

Typical pedon of Dothan loamy sand, 2 to 6 percent slopes; about 1.5 miles northeast of Ringwood on Secondary Road 1214, about 0.8 mile northwest on Secondary Road 1215, about 500 feet east on a farm path, about 100 feet northeast of the farm path, in a field; Ringwood USGS topographic quadrangle; lat. 36 degrees 13 minutes 54 seconds N. and long. 77 degrees 49 minutes 58 seconds W.

Ap—0 to 9 inches; brown (10YR 4/3) loamy sand; weak fine granular structure; very friable; common fine and medium roots; moderately acid; abrupt smooth boundary.

E—9 to 17 inches; yellowish brown (10YR 5/4) loamy sand; weak fine granular structure; very friable; few fine roots; moderately acid; clear smooth boundary.

Bt—17 to 37 inches; yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; slightly sticky, nonplastic; few faint clay films on faces of peds; few plinthite nodules; few medium distinct yellowish red (5YR 5/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Btv1—37 to 45 inches; yellowish brown (10YR 5/8) sandy clay; moderate medium subangular blocky structure; friable; slightly sticky, nonplastic; compact in place; few faint clay films on faces of peds; common plinthite nodules; common medium distinct yellowish red (5YR 5/8) masses of iron accumulation; red colors are relict redoximorphic features; moderately acid; gradual wavy boundary.

Btv2—45 to 61 inches; red (2.5YR 5/8) sandy clay; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; compact in place; few faint clay films on faces of peds; common plinthite nodules; common medium distinct yellowish red (5YR 5/8) masses of iron accumulation; red colors are relict redoximorphic features; strongly acid; gradual wavy boundary.

BC—61 to 72 inches; reticulately patterned red (2.5YR 5/8), yellowish red (5YR 5/8), and pinkish gray (7.5YR 7/2) sandy loam that has pockets of sandy clay loam; weak coarse subangular blocky structure; friable; areas with gray colors are iron depletions and areas with red colors are iron accumulations; red and gray colors are relict redoximorphic features; moderately acid.

The thickness of the solum is more than 60 inches. The content of plinthite is greater than 5 percent below a depth of 24 to 60 inches (fig. 18). The soils are moderately acid to very strongly acid unless limed.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 2 to 4.

The E horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 2 to 4. It is sand, loamy sand, loamy fine sand, sandy loam, or fine sandy loam.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 5 to 8, and chroma of 4 to 8. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur in the lower part of the horizon in some pedons. Texture is fine sandy loam, sandy loam, or sandy clay loam.

The Btv horizon generally has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 4 to 8 or is reticulately patterned in shades of red, yellow, brown, and gray. It may also have hue of 2.5YR or 5YR below a depth of 40 inches. Texture is sandy clay loam, clay loam, or sandy clay.

The BC horizon is reticulately patterned in shades of red, yellow, brown, and gray. It is sandy loam, sandy clay loam, or sandy clay.

Emporia Series

The Emporia series consists of well drained soils that formed in loamy sediments on coastal plains. Slopes range from 0 to 10 percent. These soils are fine-loamy, siliceous, thermic Typic Hapludults.

Typical pedon of Emporia fine sandy loam, 2 to 6 percent slopes; about 1.4 miles east-southeast of Darlington on Secondary Road 1001, about 0.3 mile south on a farm path, about 200 feet east of the farm path, in a field; Darlington USGS topographic quadrangle; lat. 36 degrees 18 minutes 25 seconds N. and long. 77 degrees 41 minutes 35 seconds W.

Ap—0 to 10 inches; brown (10YR 5/3) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; neutral; abrupt smooth boundary.

EB—10 to 17 inches; yellowish brown (10YR 5/6) fine sandy loam; weak fine subangular blocky structure; friable; many fine and medium roots; mildly alkaline; clear wavy boundary.

Bt1—17 to 43 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; few fine and medium roots; few faint clay films on faces of peds; slightly acid; gradual wavy boundary.

Bt2—43 to 58 inches; yellowish brown (10YR 5/6) clay;

moderate medium subangular blocky structure; firm; slightly sticky, moderately plastic; few fine roots; common distinct clay films on faces of peds; many coarse distinct gray (N 6/0) iron depletions and many coarse prominent red (10R 4/6) and common medium distinct brownish yellow (10YR 6/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

C—58 to 67 inches; yellowish brown (10YR 5/6), gray (N 6/0), strong brown (7.5YR 5/8), and red (10R 4/6 and 2.5YR 4/8) clay loam that has thin strata of sandy loam; massive; firm; areas with gray colors are iron depletions and areas with brown and red colors are iron accumulations; very strongly acid.

The thickness of the solum ranges from 40 to more than 60 inches. The soils are moderately acid to very strongly acid unless limed.

The Ap or A horizon has hue of 10YR or 2.5Y, 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 to 7, and chroma of 3 to 6. It is loamy sand, loamy fine sand, fine sandy loam, sandy loam, or loam.

The EB or BE horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 4 to 6. It is fine sandy loam, sandy loam, or loam.

The upper part of the Bt horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 3 to 8. The lower part has hue of 5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8. Iron depletions with chroma of 2 or less commonly occur below a depth of 36 inches. Masses of iron accumulation in shades of red, yellow, or brown may also occur. Texture is dominantly sandy loam, sandy clay loam, or clay loam but ranges to sandy clay or clay in the lower part of the horizon.

The C horizon has hue of 2.5YR to 5Y and value and chroma of 3 to 8. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is sandy loam, sandy clay loam, sandy clay, or clay.

Exum Series

The Exum series consists of moderately well drained soils that formed in loamy sediments on coastal plains. Slopes range from 0 to 2 percent. These soils are fine-silty, siliceous, thermic Aquic Paleudults.

Typical pedon of Exum silt loam, 0 to 2 percent slopes; about 2.4 miles northwest of Hills Crossroads on Secondary Road 1117, about 0.4 mile southwest on a logging road, about 0.4 mile southeast on the logging road, about 50 feet west of the logging road, in a wooded area; Scotland Neck USGS topographic quadrangle; lat. 36 degrees 12 minutes 23 seconds N. and long. 77 degrees 29 minutes 02 seconds W.

Ap—0 to 9 inches; gray (10YR 5/1) silt loam; weak fine granular structure; very friable; common very fine and fine roots; moderately acid; abrupt smooth boundary.

E—9 to 15 inches; light yellowish brown (10YR 6/4) silt loam; moderate medium granular structure; very friable; few very fine and common fine and medium roots; strongly acid; gradual wavy boundary.

Bt1—15 to 25 inches; yellowish brown (10YR 5/6) silt loam; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; few fine and medium roots; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt2—25 to 33 inches; yellowish brown (10YR 5/6) loam; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; few fine and medium roots; few faint clay films on faces of peds; common medium distinct light brownish gray (10YR 6/2) iron depletions; very strongly acid; gradual wavy boundary.

Bt3—33 to 62 inches; yellowish brown (10YR 5/6) loam; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; few faint clay films on faces of peds; many coarse distinct light brownish gray (10YR 6/2) iron depletions and common fine distinct strong brown (7.5YR 5/8) masses of iron accumulation; very strongly acid.

The thickness of the solum is more than 60 inches. The soils are strongly acid to extremely acid unless limed.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 2 to 6, and chroma of 1 to 3.

The E horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 2 to 4. It is very fine sandy loam, loam, or silt loam.

The upper part of the Bt horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 8. Iron depletions with chroma of 2 or less are within 30 inches of the surface and do not occur in the upper 10 inches of the Bt horizon. Masses of iron accumulation in shades of red, yellow, or brown may occur in the lower part of the horizon. The horizon is dominantly silt loam, loam, clay loam, or silty clay loam. In some pedons it is silty clay or clay below a depth of 40 inches.

The Btg horizon, if it occurs, has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Masses of iron accumulation in shades of red, yellow, or brown

may occur. Texture is loam, silt loam, clay loam, or silty clay loam.

Fuquay Series

The Fuquay series consists of well drained soils that formed in loamy sediments on coastal plains. Slopes range from 0 to 4 percent. These soils are loamy, siliceous, thermic Arenic Plinthic Kandiudults.

Typical pedon of Fuquay sand, 0 to 4 percent slopes; about 1.25 miles north of Darlington on Secondary Road 1615, about 0.5 mile west-northwest on Secondary Road 1612, about 0.3 mile south on a farm path, about 75 feet west of the farm path, in a field; Darlington USGS topographic quadrangle; lat. 36 degrees 20 minutes 08 seconds N. and long. 77 degrees 43 minutes 29 seconds W.

Ap—0 to 9 inches; brown (10YR 5/3) sand; single grained; loose; few very fine and fine roots; moderately acid; abrupt smooth boundary.

E—9 to 25 inches; light yellowish brown (2.5Y 6/4) loamy sand; weak fine granular structure; very friable; strongly acid; gradual wavy boundary.

Bt1—25 to 36 inches; yellowish brown (10YR 5/8) sandy loam; medium fine subangular blocky structure; very friable; few faint clay films on faces of peds; few fine distinct strong brown (7.5YR 5/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Bt2—36 to 42 inches; light yellowish brown (2.5Y 6/4) sandy loam; weak fine subangular blocky structure; very friable; few faint clay films on faces of peds; common medium distinct very pale brown (10YR 7/4) masses of iron accumulation; very strongly acid; clear wavy boundary.

Btv1—42 to 51 inches; yellowish brown (10YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; few faint clay films on faces of peds; common plinthite nodules; many coarse distinct light brownish gray (10YR 6/2) iron depletions and many coarse prominent red (2.5YR 4/8) masses of iron accumulation; gray and red colors are relict redoximorphic features; very strongly acid; gradual wavy boundary.

Btv2—51 to 62 inches; reticulately patterned red (2.5YR 4/8), light brownish gray (10YR 6/2), and strong brown (7.5YR 5/8) sandy clay loam that has pockets of sandy clay; moderate medium subangular blocky structure; firm; slightly sticky, nonplastic; few faint clay films on faces of peds; common plinthite nodules; areas with gray colors are iron depletions and areas with red and brown colors are iron accumulations; red, brown, and gray colors are relict redoximorphic features; very strongly acid; gradual wavy boundary.

BC—62 to 70 inches; reticulately patterned red (2.5YR 4/8), light brownish gray (10YR 6/2), and strong brown (7.5YR 5/8) sandy loam that has pockets of clay loam; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; common plinthite nodules; areas with gray colors are iron depletions and areas with red and brown colors are iron accumulations; red, brown, and gray colors are relict redoximorphic features; very strongly acid.

The thickness of the solum is more than 60 inches. The content of plinthite is greater than 5 percent below a depth of 35 to 60 inches. The soils are moderately acid to very strongly acid unless limed.

The Ap or A horizon has hue of 10YR or 2.5Y or is neutral in hue and has value of 4 or 5 and chroma of 0 to 3.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 6. It is sand, fine sand, loamy fine sand, 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. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur in the lower part of the horizon in some pedons. Texture is sandy loam, fine sandy loam, or sandy clay loam.

The Btv horizon has hue of 2.5YR to 10YR, value of 4 to 8, and chroma of 1 to 8 or is reticulately patterned in shades of red, brown, yellow, and gray. Texture is sandy loam, fine sandy loam, or sandy clay loam.

The BC horizon is reticulately patterned in shades of red, brown, yellow, and gray. It is sandy loam, sandy clay loam, or clay loam.

Goldsboro Series

The Goldsboro series consists of moderately well drained soils that formed in loamy sediments on coastal plains (fig. 19). Slopes range from 0 to 2 percent. These soils are fine-loamy, siliceous, thermic Aquic Paleudults.

Typical pedon of Goldsboro fine sandy loam, 0 to 2 percent slopes; about 0.4 mile south of the intersection of Secondary Roads 1206 and 1001 on Secondary Road 1001, about 0.3 mile east on a farm path, about 660 feet northwest of the farm path, in a field; Enfield USGS topographic quadrangle; lat. 36 degrees 11 minutes 59 seconds N. and long. 77 degrees 40 minutes 48 seconds W.

Ap—0 to 7 inches; brown (10YR 5/3) fine sandy loam;

weak medium granular structure; friable; few fine and medium roots; strongly acid; abrupt smooth boundary.

Bt1—7 to 18 inches; brownish yellow (10YR 6/6) sandy clay loam; weak medium subangular blocky structure; friable; few fine and medium roots; common faint clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt2—18 to 25 inches; yellowish brown (10YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; few fine roots; common faint clay films on faces of peds; common medium distinct strong brown (7.5YR 5/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Bt3—25 to 35 inches; yellowish brown (10YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; common faint clay films on faces of peds; few fine distinct gray (10YR 6/1) iron depletions and common medium distinct strong brown (7.5YR 5/8) masses of iron accumulation; very strongly acid; clear wavy boundary.

Bt4—35 to 52 inches; yellowish brown (10YR 5/8), gray (10YR 6/1), and strong brown (7.5YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; common faint clay films on faces of peds; areas with gray colors are iron depletions and areas with brown colors are iron accumulations; very strongly acid; gradual wavy boundary.

Bt5—52 to 72 inches; yellowish brown (10YR 6/8), gray (10YR 6/1), strong brown (7.5YR 5/8), and red (2.5YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; areas with gray colors are iron depletions and areas with brown and red colors are iron accumulations; very strongly acid.

The thickness of the solum is more than 60 inches. The soils are strongly acid to extremely acid unless limed.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 2 to 6, and chroma of 1 to 4.

The E horizon, if it occurs, has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 2 to 6. It is loamy sand, loamy fine sand, sandy loam, or fine sandy loam.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 3 to 8. Iron depletions with chroma of 2 or less occur within a depth of 30 inches. Masses of iron accumulation in shades of red, yellow, or brown may occur in the lower part of the horizon. Texture is dominantly sandy clay loam, sandy loam, loam, or clay loam. In some pedons the Bt horizon occurs at a greater depth and is clay or sandy clay.

The Btg horizon, if it occurs, has hue of 10YR to 2.5Y, value of 4 to 7, and chroma of 1 or 2. Masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is sandy clay loam, sandy loam, loam, or clay loam.

Grantham Series

The Grantham series consists of poorly drained soils that formed in loamy sediments on coastal plains (fig. 16). Slopes are 0 to 1 percent. These soils are fine-silty, siliceous, thermic Typic Paleaquults.

Typical pedon of Grantham loam, 0 to 1 percent slopes; about 1.3 miles west-northwest of North Carolina Highway 903 on Secondary Road 1810, about 250 feet south of the road, in a wooded area; Palmyra USGS topographic quadrangle; lat. 36 degrees 04 minutes 43 seconds N. and long. 77 degrees 22 minutes 06 seconds W.

Ap—0 to 8 inches; very dark gray (10YR 3/1) loam; weak fine granular structure; very friable; many fine and few medium roots; strongly acid; abrupt smooth boundary.

Eg—8 to 12 inches; light brownish gray (10YR 6/2) loam; weak fine granular structure; very friable; many fine and few medium roots; few fine distinct yellow (10YR 7/6) masses of iron accumulation; very strongly acid; abrupt wavy boundary.

Btg1—12 to 17 inches; light brownish gray (10YR 6/2) loam; weak coarse subangular blocky structure; friable; slightly sticky, nonplastic; few fine and medium roots; few faint clay films on faces of peds; many medium distinct brownish yellow (10YR 6/8) and few fine distinct strong brown (7.5YR 5/8) masses of iron accumulation; very strongly acid; clear wavy boundary.

Btg2—17 to 21 inches; light gray (10YR 7/1) loam; moderate medium subangular blocky structure; friable; slightly sticky, nonplastic; few fine and medium roots; few faint clay films on faces of peds; common coarse distinct brownish yellow (10YR 6/8) and few fine distinct strong brown (7.5YR 5/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Btg3—21 to 45 inches; light gray (10YR 7/1) loam; moderate medium subangular blocky structure; friable; slightly sticky, nonplastic; few faint clay films on faces of peds; common coarse distinct brownish yellow (10YR 6/8) and strong brown (7.5YR 5/8) masses of iron accumulation; very strongly acid; clear wavy boundary.

Btg4—45 to 60 inches; light brownish gray (10YR 6/2) loam; weak medium subangular blocky structure;

friable; slightly sticky, nonplastic; few faint clay films on faces of peds; many coarse faint light gray (10YR 7/1) iron depletions; common coarse distinct brownish yellow (10YR 6/8) and few fine prominent red (2.5YR 4/8) masses of iron accumulation; very strongly acid; clear wavy boundary.

Btg5—60 to 75 inches; light brownish gray (10YR 6/2) clay loam; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; few faint clay films on faces of peds; common coarse distinct brownish yellow (10YR 6/8) and few fine prominent strong brown (7.5YR 5/8) masses of iron accumulation; very strongly acid.

The thickness of the solum is more than 60 inches. The soils are strongly acid to extremely acid unless limed.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 2 to 5, and chroma of 1 or 2.

The Eg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. It is very fine sandy loam, loam, or silt loam.

The Btg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is loam, clay loam, or silty clay loam.

Gritney Series

The Gritney series consists of moderately well drained soils that formed in clayey sediments on coastal plains (fig. 20). Slopes range from 2 to 10 percent. These soils are clayey, mixed, thermic Aquic Hapludults.

Typical pedon of Gritney fine sandy loam, 2 to 6 percent slopes; about 2 miles south of North Carolina Highway 561 on Secondary Road 1001, about 400 feet west on a farm path, about 170 feet north of the farm path, in a field; Enfield USGS topographic quadrangle; lat. 36 degrees 14 minutes 08 seconds N. and long. 77 degrees 39 minutes 32 seconds W.

Ap—0 to 6 inches; yellowish brown (10YR 5/6) fine sandy loam; moderate fine granular structure; very friable; many fine and few medium roots; strongly acid; abrupt smooth boundary.

Bt1—6 to 14 inches; yellowish brown (10YR 5/6) sandy clay loam; moderate medium subangular blocky structure; firm; slightly sticky, nonplastic; few fine and medium roots; few faint clay films on faces of peds; very strongly acid; clear wavy boundary.

Bt2—14 to 27 inches; yellowish brown (10YR 5/8) clay; moderate medium subangular blocky structure; firm; slightly sticky, slightly plastic; few medium roots; common distinct clay films on faces of peds; common medium prominent yellowish red (5YR 5/6) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Bt3—27 to 42 inches; yellowish brown (10YR 5/8), light gray (10YR 7/2), red (2.5YR 4/8), brownish yellow (10YR 6/8), and dark yellowish brown (10YR 4/6) clay; moderate medium subangular blocky structure; firm; slightly sticky, slightly plastic; common distinct clay films on faces of peds; areas with gray colors are iron depletions and areas with brown, red, and yellow colors are iron accumulations; very strongly acid; gradual wavy boundary.

BC—42 to 57 inches; yellowish brown (10YR 5/8), light gray (10YR 7/2), red (2.5YR 4/8), brownish yellow (10YR 6/8), and dark yellowish brown (10YR 4/6) clay that has pockets of sandy clay loam; moderate medium subangular blocky structure; firm; few faint clay films on faces of peds; areas with gray colors are iron depletions and areas with brown, red, and yellow colors are iron accumulations; very strongly acid; gradual wavy boundary.

C—57 to 60 inches; yellowish brown (10YR 5/8), light gray (10YR 7/2), red (2.5YR 4/8), brownish yellow (10YR 6/8), and dark yellowish brown (10YR 4/6) clay loam; massive; friable; areas with gray colors are iron depletions and areas with brown, red, and yellow colors are iron accumulations; very strongly acid.

The thickness of the solum ranges from 35 to more than 60 inches. The soils are strongly acid to extremely acid unless limed.

The Ap or A horizon has hue of 7.5YR to 2.5Y, value of 2 to 5, and chroma of 2 to 6. It is fine sandy loam or sandy clay loam.

The upper part of the Bt horizon has hue of 5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8. The lower part has hue of 5YR to 2.5Y, value of 4 to 7, and chroma of 3 to 8. Masses of iron accumulation in shades of red, yellow, or brown may occur. Iron depletions with chroma of 2 or less are in the lower part of the horizon. Texture is dominantly clay loam, clay, or sandy clay. Thin horizons of sandy clay loam occur in some pedons.

The BC horizon has hue of 5YR to 2.5Y, value of 4 to 7, and chroma of 3 to 8. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is clay loam, clay, or sandy clay.

The C horizon is variable in color. It is dominantly sandy clay loam, loam, or clay loam that has lenses,

pockets, or strata of loamy sand, sandy loam, or sandy clay. In some pedons the lower part of the horizon is clay.

Helena Series

The Helena series consists of moderately well drained soils that formed in material weathered from felsic crystalline rocks (fig. 21). Slopes range from 0 to 3 percent. These soils are clayey, mixed, thermic Aquic Hapludults.

Typical pedon of Helena sandy loam, 0 to 3 percent slopes; about 0.25 mile south of Airlie on North Carolina Highway 4, about 75 feet west of the road, in a wooded area; Hollister USGS topographic quadrangle; lat. 36 degrees 20 minutes 00 seconds N. and long. 77 degrees 53 minutes 14 seconds W.

A—0 to 4 inches; yellowish brown (10YR 5/4) sandy loam; weak fine granular structure; friable; few fine and medium roots; moderately acid; abrupt smooth boundary.

E—4 to 8 inches; very pale brown (10YR 7/4) sandy loam; weak fine granular structure; friable; few fine and medium roots; moderately acid; gradual wavy boundary.

Bt1—8 to 15 inches; brownish yellow (10YR 6/8) sandy clay; moderate medium subangular blocky structure; friable; few faint clay films on faces of peds; few fine and medium roots; few fine prominent red (2.5YR 4/8) masses of iron accumulation; strongly acid; gradual wavy boundary.

Bt2—15 to 20 inches; reddish yellow (7.5YR 6/8) clay; moderate medium subangular blocky structure; firm; slightly sticky, slightly plastic; common distinct clay films on faces of peds; few fine and medium roots; common medium distinct gray (10YR 6/1) iron depletions and few fine distinct red (2.5YR 4/8) masses of iron accumulation; strongly acid; clear smooth boundary.

Bt3—20 to 26 inches; gray (10YR 6/1), reddish yellow (7.5YR 6/8), and red (2.5YR 4/8) clay; moderate medium subangular blocky structure; firm; slightly sticky, slightly plastic; many distinct clay films on faces of peds; areas with gray colors are iron depletions and areas with red and yellow colors are iron accumulations; strongly acid; clear smooth boundary.

Btg—26 to 37 inches; gray (10YR 6/1) clay; moderate medium subangular blocky structure; firm; slightly sticky, slightly plastic; many medium clay films on faces of peds; common medium faint white (10YR 8/1) and common medium distinct reddish yellow (7.5YR 6/8) masses of iron accumulation; strongly acid; gradual wavy boundary.

BC—37 to 48 inches; gray (10YR 6/1), white (10YR 8/1), and reddish yellow (7.5YR 6/8) clay loam that has pockets of sandy clay loam; weak medium subangular blocky structure; firm or friable; slightly sticky, nonplastic; few distinct clay films on faces of peds; areas with gray colors are iron depletions and areas with yellow colors are iron accumulations; strongly acid; gradual wavy boundary.

C—48 to 62 inches; gray (10YR 6/1), white (10YR 8/1), and reddish yellow (7.5YR 6/8) saprolite of sandy clay loam; massive; friable; areas with gray colors are iron depletions and areas with yellow colors are iron accumulations; very strongly acid.

The thickness of the solum ranges from 40 to 60 inches. The soils are strongly acid to extremely acid unless limed.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 1 to 4.

The E horizon has hue of 10YR to 5Y, value of 5 to 8, and chroma of 2 to 4. It is loamy sand, loamy coarse sand, coarse sandy loam, fine sandy loam, sandy loam, or loam.

The BE or BA horizon, if it occurs, has hue of 7.5YR to 5Y, value of 5 to 8, and chroma of 3 to 8. It is sandy clay loam or clay loam.

The Bt horizon has hue of 7.5YR to 5Y, value of 5 to 8, and chroma of 3 to 8. Iron depletions with chroma of 2 or less are in the upper 24 inches of the Bt horizon. Masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is clay loam, sandy clay, or clay.

The Btg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. It is clay loam, sandy clay, or clay.

The BC horizon has hue of 7.5YR to 5Y, value of 5 to 8, and chroma of 3 to 8. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is clay loam, sandy clay loam, loam, fine sandy loam, or sandy loam.

The C horizon is variable in color. It is saprolite that has texture of sandy loam, fine sandy loam, sandy clay loam, or loam.

Herndon Series

The Herndon series consists of well drained soils that formed in material weathered from Carolina slates. Slopes range from 2 to 10 percent. These soils are clayey, kaolinitic, thermic Typic Hapludults.

Typical pedon of Herndon silt loam, 2 to 6 percent slopes; about 0.7 mile northeast of Secondary Road 1327 on Secondary Road 1328, about 660 feet east on a logging road, 0.3 mile south on the logging road, 50 feet east of the logging road, in a wooded area; Essex USGS topographic quadrangle; lat. 36 degrees 13 minutes 55 seconds N. and long. 77 degrees 54 minutes 55 seconds W.

A—0 to 4 inches; dark grayish brown (2.5Y 4/2) silt loam; weak fine granular structure; very friable; common very fine and fine and many medium roots; strongly acid; abrupt smooth boundary.

E—4 to 8 inches; light yellowish brown (2.5Y 6/3) silt loam; weak fine granular structure; very friable; few fine and medium roots; strongly acid; clear smooth boundary.

Bt1—8 to 19 inches; strong brown (7.5YR 5/8) silty clay; moderate medium subangular blocky structure; firm; slightly sticky, slightly plastic; few faint clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt2—19 to 31 inches; strong brown (7.5YR 5/8) silty clay; few medium distinct red (2.5YR 4/8) mottles; moderate medium subangular blocky structure; firm; slightly sticky, slightly plastic; common distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt3—31 to 39 inches; yellowish red (5YR 5/8) silty clay; common medium distinct yellow (10YR 7/6) mottles; weak medium subangular blocky structure; friable; slightly sticky, slightly plastic; common distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

BC—39 to 45 inches; mottled strong brown (7.5YR 5/8), yellowish red (5YR 5/8), yellow (10YR 7/6), and red (2.5YR 4/8) silty clay loam; weak medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.

C—45 to 61 inches; mottled light gray (10YR 7/1), yellow (10YR 7/6), pinkish white (5YR 8/2), and red (2.5YR 5/8) saprolite of silt loam; massive; very friable; very strongly acid.

The thickness of the solum is more than 30 inches. The soils are strongly acid to extremely acid unless limed.

The A horizon has hue of 7.5YR to 5Y, value of 3 to 6, and chroma of 2 to 8.

The E horizon has hue of 7.5YR to 5Y, value of 4 to 6, and chroma of 3 to 6. It is silt loam, loam, or very fine sandy loam.

The Bt horizon has hue of 5YR to 10YR, value of 4 to 7, and chroma of 4 to 8. Mottles in shades of red, yellow, or brown may occur. Texture is clay, silty clay, or silty clay loam.

The BC horizon has hue of 5YR to 10YR, value of 4 to 7, and chroma of 4 to 8. Mottles in shades of red, yellow, or brown may occur. Texture is silt loam, loam, silty clay loam, or clay loam.

The C horizon is variable in color. It is saprolite that has texture of silt loam, loam, or fine sandy loam.

Lignum Series

The Lignum series consists of moderately well drained and somewhat poorly drained soils that formed in material weathered from Carolina slates. Slopes range from 0 to 3 percent. These soils are clayey, mixed, thermic Aquic Hapludults.

Typical pedon of Lignum silt loam, 0 to 3 percent slopes; about 0.3 mile south of Secondary Road 1333 on Secondary Road 1327, about 1.2 miles east on a logging road, about 75 feet south of the road, in a wooded area; Essex USGS topographic quadrangle; lat. 36 degrees 13 minutes 34 seconds N. and long. 77 degrees 54 minutes 44 seconds W.

A—0 to 4 inches; grayish brown (10YR 5/2) silt loam; moderate medium granular structure; friable; many very fine and fine roots; strongly acid; clear smooth boundary.

E—4 to 7 inches; light gray (10YR 7/2) silt loam; moderate medium granular structure; friable; common very fine and fine and few medium roots; common fine faint yellow (10YR 7/6) masses of iron accumulation; strongly acid; clear wavy boundary.

BE—7 to 13 inches; yellow (10YR 7/6) silt loam; weak medium subangular blocky structure; friable; common fine and few medium roots; common fine faint brownish yellow (10YR 6/8) and common fine distinct pale brown (10YR 6/3) iron depletions; very strongly acid; gradual wavy boundary.

Bt1—13 to 22 inches; brownish yellow (10YR 6/8) silty clay loam; moderate medium subangular blocky structure; friable; slightly sticky, slightly plastic; few fine roots; common distinct clay films on faces of peds; common fine distinct gray (10YR 6/1) iron depletions; very strongly acid; gradual wavy boundary.

Bt2—22 to 34 inches; brownish yellow (10YR 6/8) silty clay; moderate medium subangular blocky structure; friable; slightly sticky, slightly plastic; few fine roots; common distinct clay films on faces of peds; common medium faint light gray (10YR 7/1) iron depletions and common fine distinct strong

Figure 16.—Profile of a poorly drained soil, like Bethera and Grantham soils, that occurs throughout the Coastal Plain region and has severe limitations for most uses because of the high water table.

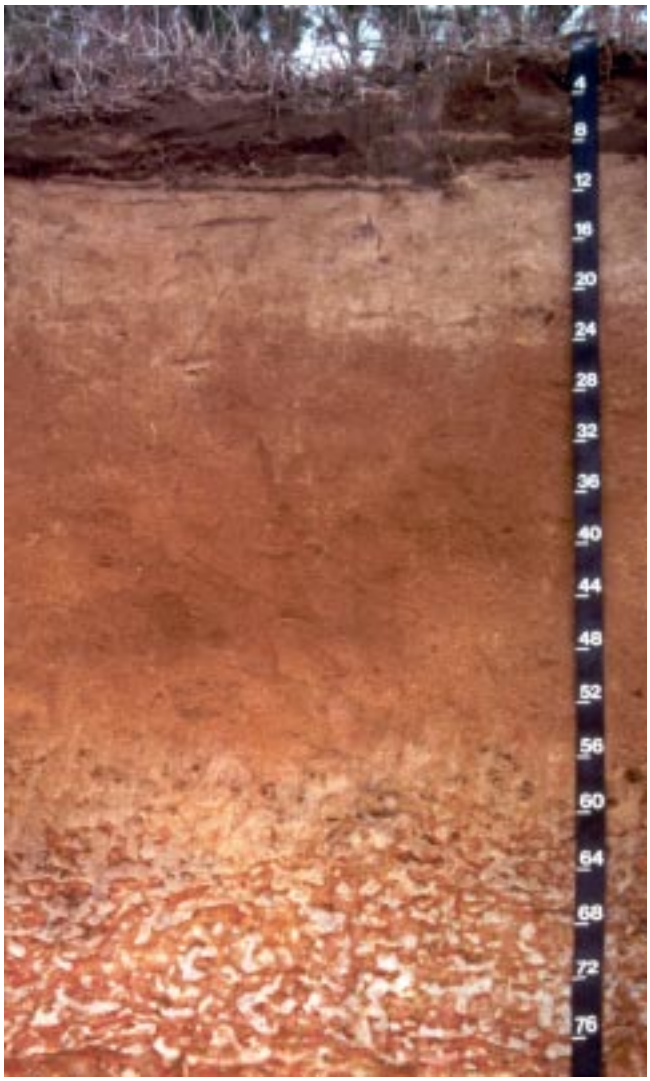

Figure 17.—Profile of a Bonneau soil. Bonneau soils have a thick, sandy surface layer that extends below a depth of 20 inches. They may be droughty during the summer. Unless they have a cover crop, the soils are susceptible to soil blowing.

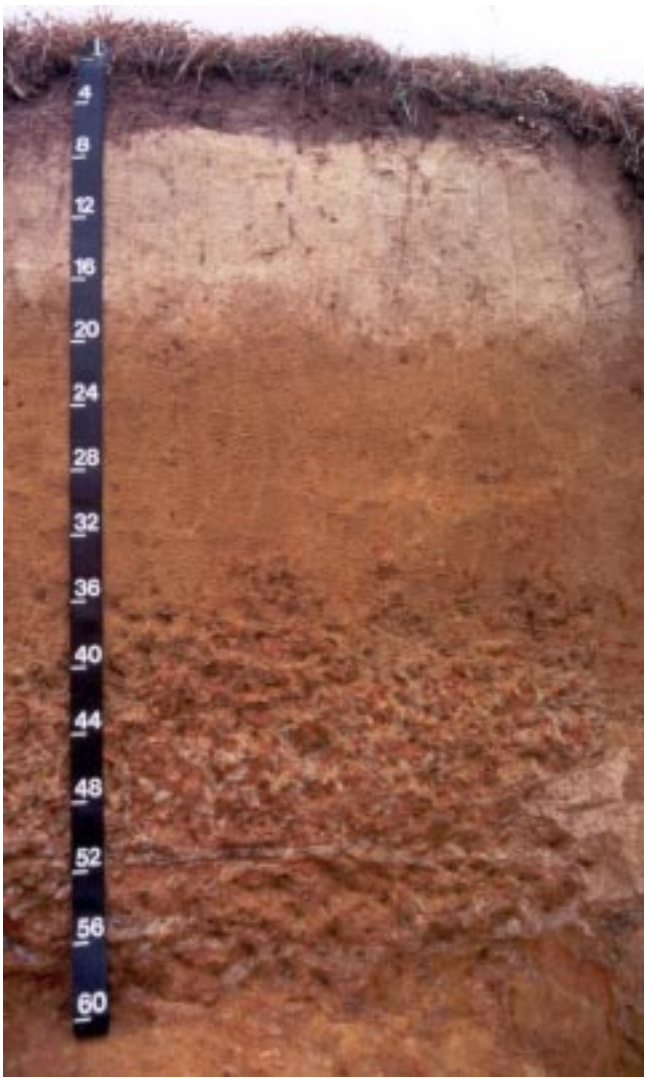

Figure 18.—Profile of a Dothan soil. Dothan soils occur in the area where the Coastal Plain and Piedmont areas meet in Halifax County. They typically occur in slightly sloping areas and are commonly used for peanut production. Plinthite is within a depth of 60 inches.

Figure 19.—Profile of a Goldsboro soil. Goldsboro soils occur throughout the Coastal Plain area. These moderately well drained soils have a water table within a depth of 30 inches. They are good for agricultural uses.

Figure 20.—Profile of a Gritney soil. Gritney soils are susceptible to erosion due to the clayey subsoil which limits the downward movement of water through the soil.

Figure 21.—Profile of a Helena soil. The clayey, moderately well drained Helena soils occur in the northwest Piedmont area in Halifax County. They have a clayey subsoil which limits the downward movement of water through the soil.

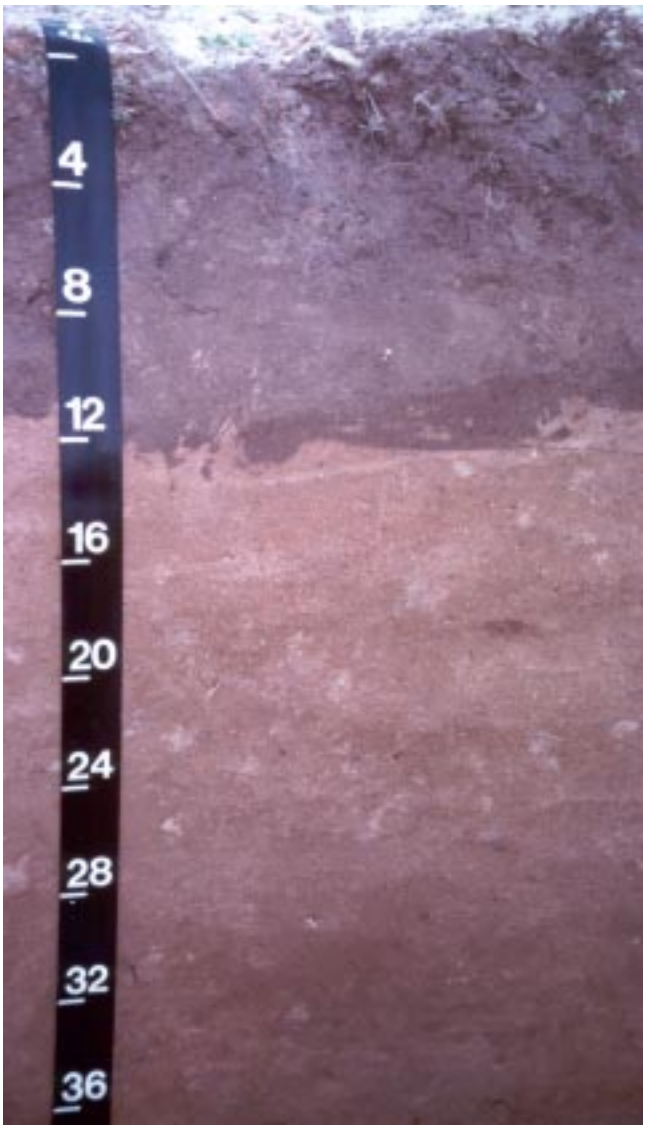

Figure 22.—Profile of a Tarboro soil. Tarboro soils occur along the terraces in the southeastern area of Halifax County. They are commonly mined for sand. There are several borrow areas in locations where Tarboro soils are mapped.

Figure 23.—Profile of a Tatum soil. Tatum soils commonly occur in the southwestern Piedmont area of Halifax County. Soft weathered bedrock, occurring between depths of 40 and 60 inches, is a limitation affecting some uses.

brown (7.5YR 5/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Bt3—34 to 46 inches; pale brown (10YR 6/3), gray (10YR 6/1), and strong brown (7.5YR 5/8) silty clay; weak medium subangular blocky structure; firm; slightly sticky, slightly plastic; few fine roots; common distinct clay films on faces of peds; areas with gray colors are iron depletions and areas with brown colors are iron accumulations; very strongly acid; gradual wavy boundary.

C—46 to 58 inches; pale olive (5Y 6/4), pale yellow (2.5Y 7/4), and white (N 8/0) saprolite of silty clay loam; massive; friable; few fine roots; very strongly acid; clear wavy boundary.

Cr—58 to 63 inches; pale olive (5Y 6/4), pale yellow (2.5Y 7/4), and white (N 8/0) strongly weathered slate rock that crushes to silty soil material; rock controlled structure; firm in place, friable when dug; very strongly acid.

The thickness of the solum ranges from 20 to 50 inches. The depth to soft bedrock ranges from 40 to 60 inches. The soils are strongly acid or very strongly acid unless limed.

The Ap or A horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 1 to 4.

The E horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 1 to 6. It is very fine sandy loam, loam, or silt loam.

The BE or BA horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 3 to 8. It is silt loam, silty clay loam, loam, or clay loam.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 1 to 8. Iron depletions with chroma of 2 or less are in the upper 10 inches of the horizon. Masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is clay loam, clay, silty clay loam, or silty clay.

The BC or CB horizon, if it occurs, has hue of 7.5YR to 5Y, value of 5 to 7, and chroma of 1 to 8. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is silt loam, loam, silty clay loam, or clay loam.

The C horizon is variable in color. It is saprolite that has texture of sandy clay loam, silty clay loam, or silt loam.

Lynchburg Series

The Lynchburg series consists of somewhat poorly drained soils that formed in loamy sediments on coastal plains. Slopes range from 0 to 2 percent. These soils are fine-loamy, siliceous, thermic Aeric Paleaquults.

Typical pedon of Lynchburg fine sandy loam, 0 to 2 percent slopes; about 0.4 mile west of Interstate 95 on Secondary Road 1002, about 150 feet north on a farm path, about 50 feet east of the farm path, in a field; Ringwood USGS topographic quadrangle; lat. 36 degrees 12 minutes 49 seconds N. and long. 77 degrees 45 minutes 39 seconds W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak medium granular structure; friable; common fine and few medium roots; strongly acid; clear smooth boundary.

Bt1—8 to 19 inches; pale brown (10YR 6/3) sandy clay loam; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; few fine and medium roots; few faint clay films on faces of peds; common medium distinct light gray (10YR 7/2) iron depletions and common medium distinct brownish yellow (10YR 6/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Bt2—19 to 50 inches; gray (10YR 6/1), strong brown (7.5YR 5/8), and red (2.5YR 4/8) sandy clay loam; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; few faint clay films on faces of peds; areas with gray colors are iron depletions and areas with brown and red colors are iron accumulations; very strongly acid; gradual wavy boundary.

Btg—50 to 68 inches; gray (10YR 6/1) sandy clay loam; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; few faint clay films on faces of peds; common medium distinct brownish yellow (10YR 6/8), common medium distinct strong brown (7.5YR 5/8), and few fine prominent red (2.5YR 4/8) masses of iron accumulation; very strongly acid.

The thickness of the solum is more than 60 inches. The soils are strongly acid to extremely acid unless limed.

The Ap or A horizon has hue of 10YR or 2.5Y or is neutral in hue and has value of 2 to 4 and chroma of 0 to 2.

The E horizon, if it occurs, has hue of 10YR or 2.5Y or is neutral in hue and has value of 4 to 7 and chroma of 1 to 4. It is loamy sand, loamy fine sand, sandy loam, fine sandy loam, or loam.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 to 8. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is

sandy loam, fine sandy loam, sandy clay loam, loam, or clay loam.

The Btg horizon has hue of 10YR to 5Y or is neutral in hue and has value of 4 to 7 and chroma of 0 to 2. Masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is dominantly sandy loam, fine sandy loam, sandy clay loam, loam, or clay loam. It can range to clay or sandy clay below a depth of 40 inches.

Marlboro Series

The Marlboro series consists of well drained soils that formed in clayey sediments on coastal plains. Slopes range from 0 to 6 percent. These soils are clayey, kaolinitic, thermic Typic Paleudults.

Typical pedon of Marlboro fine sandy loam, 2 to 6 percent slopes; about 0.9 mile northeast on Secondary Road 1327 from its intersection with Secondary Road 1206, about 0.5 mile south on a farm path, about 600 feet southwest of the farm path, in a field; Enfield USGS topographic quadrangle; lat. 36 degrees 13 minutes 55 seconds N. and long. 77 degrees 41 minutes 15 seconds W.

Ap—0 to 7 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine granular structure; very friable; common fine and few medium roots; strongly acid; abrupt smooth boundary.

Bt1—7 to 16 inches; yellowish brown (10YR 5/8) clay loam; moderate medium subangular blocky structure; friable; slightly sticky, nonplastic; few fine and medium roots; few faint clay films on faces of peds; very strongly acid; clear wavy boundary.

Bt2—16 to 48 inches; yellowish brown (10YR 5/8) clay; moderate medium subangular blocky structure; friable; moderately sticky, slightly plastic; few fine roots; common distinct clay films on faces of peds; common medium distinct yellowish red (5YR 5/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Bt3—48 to 52 inches; yellowish brown (10YR 5/8) clay; moderate medium subangular blocky structure; firm; moderately sticky, slightly plastic; common distinct clay films on faces of peds; few medium distinct light gray (10YR 7/2) iron depletions and common medium distinct yellowish red (5YR 5/8) and few fine prominent red (10R 4/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Bt4—52 to 66 inches; yellowish brown (10YR 5/8), light gray (10YR 7/2), yellowish red (5YR 5/8), and red (10R 4/8) clay; moderate medium subangular blocky structure; firm; moderately sticky, slightly plastic; common distinct clay films on faces of peds; areas with gray colors are iron depletions and areas with brown and red colors are iron accumulations; very strongly acid; gradual wavy boundary.

Bt5—66 to 74 inches; yellowish brown (10YR 5/8), light gray (10YR 7/2), yellowish red (5YR 5/8), and red (10R 4/8) clay; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; few discontinuous clay films on faces of peds; areas with gray colors are iron depletions and areas with brown and red colors are iron accumulations; very strongly acid.

The thickness of the solum is more than 60 inches. The soils are moderately acid to very strongly acid unless limed.

The Ap or A horizon has hue of 10YR, value of 4 or 5, and chroma of 1 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 5. It is loamy sand, loamy fine sand, sandy loam, fine sandy loam, or very fine sandy loam.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur in the lower part of the horizon. Texture is clay loam, sandy clay, or clay.

Nahunta Series

The Nahunta series consists of somewhat poorly drained soils that formed in loamy sediments on coastal plains. Slopes range from 0 to 2 percent. These soils are fine-silty, siliceous, thermic Aeric Paleaquults.

Typical pedon of Nahunta silt loam, 0 to 2 percent slopes; about 3.5 miles south of Scotland Neck on North Carolina Highway 125, about 1.9 miles southwest on Secondary Road 1815, about 0.2 mile south on Secondary Road 1817, about 150 feet west of the road, in a field; Hobgood USGS topographic quadrangle; lat. 36 degrees 03 minutes 00 seconds N. and long. 77 degrees 26 minutes 53 seconds W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam; weak medium granular structure; very friable; many fine and medium roots; strongly acid; abrupt wavy boundary.

Bt1—8 to 19 inches; light yellowish brown (10YR 6/4) loam; weak fine subangular blocky structure; friable; slightly sticky, nonplastic; many fine and medium roots; few faint clay films on faces of

peds; few fine faint light brownish gray (10YR 6/2) iron depletions and few fine faint yellowish brown (10YR 5/6) masses of iron accumulation; very strongly acid; clear wavy boundary.

Bt2—19 to 25 inches; light yellowish brown (10YR 6/4) loam; moderate medium subangular blocky structure; friable; slightly sticky, nonplastic; common very fine and fine roots; few faint clay films on faces of peds; common medium distinct gray (10YR 6/1) iron depletions and many coarse distinct brownish yellow (10YR 6/8) and few medium distinct strong brown (7.5YR 5/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Btg1—25 to 42 inches; gray (10YR 6/1) clay loam; moderate medium subangular blocky structure; friable; slightly sticky, nonplastic; few faint clay films on faces of peds; many coarse distinct yellowish brown (10YR 5/8) and few medium distinct yellowish red (5YR 5/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Btg2—42 to 56 inches; gray (10YR 5/1) clay loam; moderate medium subangular blocky structure; friable; slightly sticky, nonplastic; few faint clay films on faces of peds; many medium distinct brownish yellow (10YR 6/6), common fine distinct very pale brown (10YR 7/4), and common fine distinct light gray (10YR 7/2) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Btg3—56 to 69 inches; light gray (10YR 7/1) clay loam; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; few faint clay films on faces of peds; many coarse distinct brownish yellow (10YR 6/8) masses of iron accumulation; very strongly acid; clear wavy boundary.

Btg4—69 to 75 inches; gray (10YR 5/1) clay loam; weak coarse subangular blocky structure; firm; slightly sticky, nonplastic; few faint clay films on faces of peds; many coarse distinct brownish yellow (10YR 6/8) masses of iron accumulation; very strongly acid.

The thickness of the solum is more than 60 inches. The soils are strongly acid to extremely acid unless limed.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 2 to 5, and chroma of 1 or 2.

The E horizon, if it occurs, has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 2 to 4. It is very fine sandy loam, loam, or silt loam.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 5 or 6, and chroma of 3 to 8. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is silt loam, loam, clay loam, or silty clay loam.

The Btg horizon has hue of 10YR to 5Y or is neutral in hue and has value of 5 to 7 and chroma of 0 to 2. Masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is silt loam, loam, clay loam, or silty clay loam.

Nankin Series

The Nankin series consists of well drained soils that formed in clayey sediments on coastal plains. Slopes range from 1 to 6 percent. These soils are clayey, kaolinitic, thermic Typic Kanhapludults.

Typical pedon of Nankin gravelly loamy sand, 1 to 6 percent slopes; about 0.75 mile south-southwest of Secondary Road 1001 on North Carolina Highway 48, about 990 feet east on a farm path, about 660 feet south on the farm path, about 200 feet west of the farm path, in a field; Aurelian Springs USGS topographic quadrangle; lat. 36 degrees 21 minutes 06 seconds N. and long. 77 degrees 48 minutes 25 seconds W.

Ap—0 to 9 inches; yellowish brown (10YR 5/4) gravelly loamy sand; weak fine granular structure; very friable; many fine and medium roots; common ironstone nodules; strongly acid; abrupt smooth boundary.

Bt1—9 to 14 inches; strong brown (7.5YR 5/8) clay; weak medium subangular blocky structure; firm; moderately sticky, slightly plastic; many fine and medium roots; common ironstone nodules; common distinct clay films on faces of peds; few fine distinct yellowish red (5YR 5/8) and few medium prominent red (2.5YR 4/8) masses of iron accumulation; very strongly acid; clear wavy boundary.

Bt2—14 to 25 inches; yellowish red (5YR 5/8) clay; common fine distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm; moderately sticky, slightly plastic; few fine and medium roots; common ironstone nodules; common distinct clay films on faces of peds; very strongly acid; clear wavy boundary.

Bt3—25 to 44 inches; red (2.5YR 4/8) clay; common fine prominent strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm; moderately sticky, slightly plastic; common ironstone nodules; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt4—44 to 52 inches; mottled strong brown (7.5YR 5/8), yellowish red (5YR 5/8), and red (2.5YR 4/8) clay; weak medium subangular blocky structure; friable; moderately sticky, nonplastic; few ironstone nodules; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

C—52 to 64 inches; mottled strong brown (7.5YR 5/8), yellowish red (5YR 5/8), and red (2.5YR 4/8) sandy clay loam that has pockets of sandy clay; massive; friable; slightly sticky, nonplastic; very strongly acid.

The thickness of the solum is more than 40 inches. The quantity of ironstone nodules ranges from none to common in the A and B horizons. The soils are strongly acid or very strongly acid unless limed.

The Ap or A horizon has hue of 5YR to 10YR, value of 3 to 6, and chroma of 1 to 5.

The Bt horizon has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 6 to 8. Mottles in shades of red, brown, or yellow may occur. Texture is clay loam, sandy clay, or clay.

The BC horizon, if it occurs, is mottled in shades of red, brown, yellow, or gray. It is sandy clay loam or sandy loam and has pockets and thin strata of loamy sand, sandy loam, sandy clay loam, or sandy clay.

The C horizon is mottled in shades of red, brown, yellow, or gray. It is sandy clay loam or sandy loam and has pockets and thin strata of loamy sand, sandy loam, sandy clay loam, or sandy clay.

Noboco Series

The Noboco series consists of well drained soils that formed in loamy sediments on coastal plains. Slopes range from 0 to 2 percent. These soils are fine-loamy, siliceous, thermic Typic Paleudults.

Typical pedon of Noboco fine sandy loam, 0 to 2 percent slopes; about 1.1 miles west of North Carolina Highway 125 on Secondary Road 1100, about 400 feet north on a farm path, about 100 feet west of the farm path, in a field; Hobgood USGS topographic quadrangle; lat. 36 degrees 04 minutes 25 seconds N. and long. 77 degrees 26 minutes 50 seconds W.

Ap—0 to 10 inches; yellowish brown (10YR 5/4) fine sandy loam; weak medium granular structure; very friable; common fine and medium roots; neutral; abrupt smooth boundary.

EB—10 to 18 inches; very pale brown (10YR 7/4) fine sandy loam; many coarse distinct brownish yellow (10YR 6/6) mottles; weak fine subangular blocky structure; friable; many fine and medium roots; neutral; clear smooth boundary.

Bt1—18 to 30 inches; yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; few fine and medium roots; few faint clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt2—30 to 42 inches; yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; few faint clay films on faces of peds; few fine distinct pale yellow (10YR 7/4) iron depletions and common medium distinct yellowish red (5YR 5/8) masses of iron accumulation; strongly acid; gradual wavy boundary.

Bt3—42 to 54 inches; yellowish brown (10YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; few distinct clay films on faces of peds; few fine distinct light gray (10YR 7/2) iron depletions and common coarse distinct yellowish red (5YR 5/8) and many medium distinct strong brown (7.5YR 5/8) masses of iron accumulation; strongly acid; gradual wavy boundary.

Bt4—54 to 64 inches; yellowish brown (10YR 5/8) sandy clay loam that has pockets of sandy clay; moderate medium subangular blocky structure; firm; few faint clay films on faces of peds; many medium distinct light gray (10YR 7/2) iron depletions and common coarse distinct yellowish red (5YR 5/8) and many medium prominent red (2.5YR 4/8) masses of iron accumulation; very strongly acid.

The thickness of the solum is more than 60 inches. The soils are strongly acid to extremely acid unless limed.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 to 4.

The E horizon, if it occurs, has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 2 to 8. It is loamy sand, loamy fine sand, fine sand, fine sandy loam, or sandy loam.

The EB or BE horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 2 to 8. It is fine sandy loam or sandy loam.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 3 to 6, and chroma of 3 to 8. Masses of iron accumulation in shades of red, yellow, or brown may occur in the upper part of the horizon. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur in the lower part. The horizon is dominantly fine sandy loam, sandy loam, sandy clay loam, or clay loam and may contain thin layers of sandy clay below a depth of 40 inches.

Pacolet Series

The Pacolet series consists of well drained soils that formed in material weathered from felsic crystalline rock. Slopes range from 2 to 6 percent. These soils are clayey, kaolinitic, thermic Typic Kanhapludults.

Typical pedon of Pacolet sandy loam, 2 to 6 percent slopes; about 1.1 miles northwest of North Carolina Highway 48 on Secondary Road 1300, about 250 feet northwest on a farm path, about 0.3 mile northeast on the farm path, about 100 feet north of the farm path, in a field; Aurelian Springs USGS topographic quadrangle; lat. 36 degrees 19 minutes 13 seconds N. and long. 77 degrees 50 minutes 36 seconds W.

Ap—0 to 8 inches; yellowish brown (10YR 5/4) sandy loam; weak fine granular structure; friable; many very fine, fine, and medium roots; strongly acid; abrupt smooth boundary.

Bt—8 to 27 inches; red (2.5YR 4/8) clay; moderate medium subangular blocky structure; friable; slightly sticky, nonplastic; few fine and medium roots; common fine flakes of mica; very strongly acid; gradual wavy boundary.

BC—27 to 35 inches; red (2.5YR 4/8) clay loam; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; common fine flakes of mica; very strongly acid; gradual wavy boundary.

C—35 to 63 inches; white (10YR 8/1), reddish yellow (7.5YR 7/6), and red (2.5YR 4/8) saprolite of sandy clay loam; massive; friable; common fine flakes of mica; very strongly acid.

The thickness of the solum ranges from 20 to 40 inches. The soils are moderately acid to very strongly acid unless limed.

The Ap or A horizon generally has hue of 5YR to 10YR, value of 3 to 5, and chroma of 1 to 4. In eroded areas it has hue of 2.5YR to 10YR, value of 3 to 5, and chroma of 1 to 8. Texture is sandy loam or sandy clay loam.

The E horizon, if it occurs, has hue of 5YR to 10YR, value of 4 to 6, and chroma of 3 to 8. It is loamy sand, fine sandy loam, sandy loam, or loam.

The BE or BA horizon, if it occurs, has hue of 2.5YR to 10YR, value of 4 or 5, and chroma of 3 to 8. It is clay loam, sandy clay loam, or loam.

The Bt horizon has hue of 10R or 2.5YR, value of 4 or 5, and chroma of 6 to 8. Mottles in shades of brown or yellow may occur. Texture is clay loam, sandy clay, or clay.

The BC horizon has hue of 10R to 5YR, value of 4 or 5, and chroma of 6 to 8 or is mottled in shades of red, brown, or yellow. It is sandy loam, loam, sandy clay loam, or clay loam.

The C horizon is mottled in shades of red, yellow, brown, or white. It is saprolite that has texture of sandy loam, sandy clay loam, or loam.

Rains Series

The Rains series consists of poorly drained soils that formed in loamy sediments on coastal plains. Slopes are 0 to 1 percent. These soils are fine-loamy, siliceous, thermic Typic Paleaquults.

Typical pedon of Rains fine sandy loam, 0 to 1 percent slopes; about 0.5 mile north of Secondary Road 1207 on Secondary Road 1208, about 0.3 mile southeast of the road, in a wooded area; Enfield USGS topographic quadrangle; lat. 36 degrees 14 minutes 43 seconds N. and long. 77 degrees 42 minutes 55 seconds W.

Ap—0 to 7 inches; grayish brown (10YR 5/2) fine sandy loam; weak medium granular structure; friable; common very fine, fine, and medium roots; very strongly acid; abrupt wavy boundary.

Btg1—7 to 15 inches; gray (10YR 6/1) sandy clay loam; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; common fine and few medium roots; few faint clay films on faces of peds; common medium distinct brownish yellow (10YR 6/8) and few fine distinct reddish yellow (7.5YR 6/8) masses of iron accumulation; very strongly acid; clear wavy boundary.

Btg2—15 to 28 inches; gray (10YR 6/1) sandy clay loam; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; few faint clay films on faces of peds; common medium distinct brownish yellow (10YR 6/8) and few fine distinct reddish yellow (7.5YR 6/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Btg3—28 to 40 inches; gray (10YR 6/1) clay loam; weak medium subangular blocky structure; friable; moderately sticky, nonplastic; few faint clay films on faces of peds; common medium distinct brownish yellow (10YR 6/8) and common fine distinct reddish yellow (7.5YR 6/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Btg4—40 to 55 inches; gray (10YR 6/1) clay loam; weak medium subangular blocky structure; firm; moderately sticky, nonplastic; common distinct clay films on faces of peds; common medium distinct brownish yellow (10YR 6/8) and common

medium distinct reddish yellow (7.5YR 6/8) and yellowish red (5YR 5/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Btg5—55 to 72 inches; gray (10YR 6/1) clay loam; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; few faint clay films on faces of peds; common medium distinct brownish yellow (10YR 6/8) and common medium distinct reddish yellow (7.5YR 6/8) masses of iron accumulation; very strongly acid.

The thickness of the solum is more than 60 inches. The soils are strongly acid to extremely acid unless limed.

The Ap or A horizon has hue of 10YR to 2.5Y or is neutral in hue and has value of 2 to 5 and chroma of 0 to 2.

The E horizon, if it occurs, has hue of 10YR to 5Y or is neutral in hue and has value of 4 to 7 and chroma of 0 to 2. It is sand, loamy sand, loamy fine sand, sandy loam, fine sandy loam, very fine sandy loam, or loam.

The Btg horizon has hue of 10YR to 5Y or is neutral in hue and has value of 4 to 7 and chroma of 0 to 2. Masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is dominantly sandy clay loam or clay loam but ranges to sandy loam in the upper part of the horizon and to sandy clay in the lower part.

Riverview Series

The Riverview series consists of well drained soils that formed in loamy fluvial sediments. Slopes are 0 to 1 percent. These soils are fine-loamy, mixed, thermic Fluventic Dystrochrepts.

Typical pedon of Riverview loam, 0 to 1 percent slopes, occasionally flooded; about 1.4 miles east-southeast of the end of Secondary Road 1800 on a farm path, about 0.2 mile south on the farm path, about 0.2 mile south-southwest on the farm path, about 0.1 mile east on the farm path, about 200 feet northwest of the farm path, in a wooded area; Palmyra USGS topographic quadrangle; lat. 36 degrees 07 minutes 14 seconds N. and long. 77 degrees 15 minutes 14 seconds W.

A—0 to 6 inches; very dark grayish brown (10YR 3/2) loam; weak fine granular structure; very friable; many fine roots; few fine flakes of mica; moderately acid; clear wavy boundary.

Bw1—6 to 15 inches; strong brown (7.5YR 4/6) fine sandy loam; weak fine subangular blocky structure; friable; few fine roots; many fine flakes of mica; moderately acid; gradual wavy boundary.

Bw2—15 to 18 inches; strong brown (7.5YR 4/6) fine sandy loam; weak fine granular structure; very friable; many fine flakes of mica; moderately acid; gradual wavy boundary.

Bw3—18 to 32 inches; strong brown (7.5YR 4/6) clay loam; weak medium subangular blocky structure; friable; common fine flakes of mica; moderately acid; clear smooth boundary.

C1—32 to 38 inches; strong brown (7.5YR 4/6) fine sandy loam; massive; very friable; many fine flakes of mica; moderately acid; clear smooth boundary.

C2—38 to 42 inches; brown (7.5YR 4/4) fine sandy loam; massive; very friable; common fine flakes of mica; moderately acid; clear smooth boundary.

Ab—42 to 50 inches; dark brown (10YR 3/3) loam; massive; very friable; moderately acid; clear wavy boundary.

C3—50 to 63 inches; strong brown (7.5YR 5/6) fine sandy loam; massive; very friable; many fine flakes of mica; moderately acid.

The thickness of the solum ranges from 24 to 60 inches. The soils range from moderately acid to very strongly acid unless limed.

The Ap or A horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 6.

The Bw horizon dominantly has hue of 7.5YR, value of 4 to 6, and chroma of 3 to 8 or has hue of 10YR, value of 3 to 5, and chroma of 3 to 8. In some pedons it has hue of 5YR, value of 4 or 5, and chroma of 3 or 4. Masses of iron accumulation in shades of red, yellow, or brown may occur. Iron depletions with chroma of 2 or less may occur below a depth of 24 inches. Texture is fine sandy loam, sandy loam, sandy clay loam, loam, clay loam, silty clay loam, or silt loam.

The C horizon has hue of 7.5YR or 10YR and value and chroma of 4 to 8. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur. The horizon is sand, loamy sand, loamy fine sand, sandy loam, fine sandy loam, or loam and contains strata of finer or coarser textured material.

The Ab horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 6. It is very fine sandy loam, loam, silt loam, fine sandy loam, sandy loam, loamy fine sand, or loamy sand.

Roanoke Series

The Roanoke series consists of poorly drained soils that formed in clayey fluvial sediments. Slopes range

from 0 to 2 percent. These soils are clayey, mixed, thermic Typic Endoaquults.

Typical pedon of Roanoke loam, 0 to 2 percent slopes, occasionally flooded; about 1.0 mile east of Pender on North Carolina Highway 561, about 0.5 mile south on a logging road, about 50 feet east of the logging road, in a wooded area; Halifax USGS topographic quadrangle; lat. 36 degrees 18 minutes 03 seconds N. and long. 77 degrees 34 minutes 42 seconds W.

A—0 to 5 inches; very dark gray (10YR 3/1) loam; weak fine granular structure; friable; many very fine, fine, and medium roots; strongly acid; abrupt smooth boundary.

Eg—5 to 8 inches; grayish brown (2.5Y 5/2) loam; weak medium granular structure; friable; few very fine and common fine and medium roots; common medium distinct yellowish brown (10YR 5/8) masses of iron accumulation; very strongly acid; clear smooth boundary.

Btg—8 to 52 inches; gray (5Y 6/1) clay; weak medium subangular blocky structure; firm; moderately sticky, moderately plastic; few fine and medium roots; common distinct clay films on faces of peds; common medium distinct light yellowish brown (2.5Y 6/4) and common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Cg—52 to 70 inches; light brownish gray (2.5Y 6/2) and yellowish red (5YR 5/8) loam; massive; friable; areas with gray colors are iron depletions and areas with red colors are iron accumulations; very strongly acid.

The thickness of the solum ranges from 40 to 60 inches. The soils are strongly acid to extremely acid unless limed.

The Ap or A horizon has hue of 10YR to 5Y or is neutral in hue and has value of 2 to 6 and chroma of 0 to 2.

The Eg horizon has hue of 10YR to 5Y or is neutral in hue and has value of 4 to 7 and chroma of 0 to 2. It is silt loam, loam, silty clay loam, clay loam, or fine sandy loam.

The BAg or BEg horizon, if it occurs, has hue of 10YR to 5Y or is neutral in hue and has value of 4 to 7 and chroma of 0 to 2. Masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is loam, silt loam, clay loam, or silty clay loam.

The Btg horizon has hue of 10YR to 5Y or is neutral in hue and has value of 4 to 7 and chroma of 0 to 2. Masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is clay loam, clay, silty clay, or silty clay loam.

The BC horizon, if it occurs, has hue of 10YR to 5Y or is neutral in hue and has value of 4 to 7 and chroma of 0 to 2. Masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is sandy clay loam, clay loam, clay, or silty clay loam.

The C or Cg horizon is variable in color. Texture ranges from sand to clay.

Seabrook Series

The Seabrook series consists of moderately well drained soils that formed in sandy fluvial sediments. Slopes range from 0 to 2 percent slopes. These soils are mixed, thermic Aquic Udipsamments.

Typical pedon of Seabrook loamy sand, 0 to 2 percent slopes, rarely flooded; about 2.0 miles north-northwest of Secondary Road 1102 on Secondary Road 1105, about 0.75 mile west-northwest on a farm path, about 120 feet east of the farm path, in a field; Draughn USGS topographic quadrangle; lat. 36 degrees 07 minutes 24 seconds N. and long. 77 degrees 31 minutes 56 seconds W.

Ap—0 to 9 inches; dark brown (10YR 4/3) loamy sand; single grained; loose; few fine roots; strongly acid; abrupt smooth boundary.

C1—9 to 24 inches; yellowish brown (10YR 5/4) loamy sand; single grained; loose; very strongly acid; gradual wavy boundary.

C2—24 to 31 inches; light yellowish brown (10YR 6/4) loamy sand; single grained; loose; common coarse faint light gray (10YR 7/2) iron depletions; very strongly acid; gradual wavy boundary.

C3—31 to 36 inches; light yellowish brown (10YR 6/4) coarse sand; single grained; loose; common coarse faint light gray (10YR 7/2) iron depletions; very strongly acid; gradual wavy boundary.

C4—36 to 63 inches; yellowish brown (10YR 5/4) coarse sand; single grained; loose; common medium distinct light brownish gray (10YR 6/2) iron depletions; very strongly acid.

The sandy horizons are more than 72 inches thick. The soils range from slightly acid to extremely acid unless limed.

The Ap or A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3.

The upper part of the C horizon has hue of 10YR to 2.5Y, value of 4 to 7, and chroma of 3 to 8. The lower part has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 to 4. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur in the lower part of the

horizon. Texture is loamy coarse sand, loamy sand, loamy fine sand, fine sand, coarse sand, or sand.

State Series

The State series consists of well drained soils that formed in loamy fluvial sediments. Slopes range from 0 to 6 percent. These soils are fine-loamy, mixed, thermic Typic Hapludults.

Typical pedon of State fine sandy loam, 0 to 2 percent slopes; about 0.6 mile east-southeast of the intersection of U.S. Highways 158 and 301 on Secondary Road 1150, about 1.6 miles southeast on a farm path, about 400 feet northeast on the farm path, about 50 feet north of the farm path, in a field; Weldon USGS topographic quadrangle; lat. 36 degrees 24 minutes 17 seconds N. and long. 77 degrees 34 minutes 82 seconds W.

Ap—0 to 6 inches; dark yellowish brown (10YR 4/4) fine sandy loam; moderate medium granular structure; very friable; many fine and medium roots; slightly acid; abrupt smooth boundary.

Bt1—6 to 15 inches; strong brown (7.5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; friable; many fine and medium roots; few faint clay films on faces of peds; strongly acid; clear smooth boundary.

Bt2—15 to 44 inches; strong brown (7.5YR 5/6) sandy clay loam; moderate medium subangular blocky structure; friable; few fine and medium roots; few faint clay films on faces of peds; strongly acid; gradual wavy boundary.

BC—44 to 53 inches; strong brown (7.5YR 5/6) fine sandy loam; weak fine subangular blocky structure; friable; strongly acid; gradual wavy boundary.

C1—53 to 66 inches; strong brown (7.5YR 5/8) very fine sandy loam; massive; friable; strongly acid; gradual wavy boundary.

C2—66 to 75 inches; yellowish brown (10YR 5/6) very fine sandy loam; massive; friable; strongly acid.

The thickness of the solum ranges from 30 to 60 inches. The soils are slightly acid to extremely acid unless limed.

The Ap or A horizon has hue of 7.5YR to 2.5Y, value of 3 to 6, and chroma of 2 to 6.

The E horizon, if it occurs, has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 3 to 8. It is loamy sand, loamy fine sand, sandy loam, fine sandy loam, very fine sandy loam, loam, or silt loam.

The BE horizon, if it occurs, has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is sandy loam, fine sandy loam, very fine sandy loam, loam, silt loam, or sandy clay loam.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur in the lower part of the horizon. Texture is sandy clay loam, loam, or clay loam.

The BC horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is very fine sandy loam, fine sandy loam, sandy loam, loam, or sandy clay loam.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 2 to 8. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is sand, loamy sand, loamy fine sand, fine sandy loam, very fine sandy loam, or sandy loam.

Tarboro Series

The Tarboro series consists of somewhat excessively drained soils that formed in sandy fluvial sediments (fig. 22). Slopes range from 0 to 3 percent. These soils are mixed, thermic Typic Udipsamments.

Typical pedon of Tarboro loamy sand, 0 to 3 percent slopes; about 0.8 mile northwest of Secondary Road 1102 on Secondary Road 1105, about 50 feet northeast of the road, in a field; Draughn USGS topographic quadrangle; lat. 36 degrees 06 minutes 09 seconds N. and long. 77 degrees 31 minutes 08 seconds W.

Ap—0 to 9 inches; dark yellowish brown (10YR 3/4) loamy sand; weak medium granular structure; very friable; few fine and medium roots; strongly acid; abrupt smooth boundary.

C1—9 to 29 inches; strong brown (7.5YR 5/6) loamy sand; single grained; loose; strongly acid; gradual wavy boundary.

C2—29 to 60 inches; brownish yellow (10YR 6/6) coarse sand; single grained; loose; strongly acid; clear wavy boundary.

C3—60 to 82 inches; light yellowish brown (10YR 6/4) coarse sand; single grained; loose; strongly acid.

The sandy horizons are more than 80 inches thick. The soils range from slightly acid to strongly acid unless limed.

The Ap or A horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 6.

The Bw horizon, if it occurs, has hue of 10YR or

7.5YR, value of 5 or 6, and chroma of 6 to 8. It is loamy sand, loamy fine sand, or sand.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 3 to 8. It is coarse sand, sand, loamy coarse sand, loamy fine sand, or loamy sand.

Tatum Series

The Tatum series consists of well drained soils that formed in material weathered from Carolina slates. Slopes range from 2 to 25 percent. These soils are clayey, mixed, thermic Typic Hapludults.

Typical pedon of Tatum silty clay loam, 2 to 6 percent slopes, eroded; about 1.4 miles southeast of Essex on Secondary Road 1333, about 500 feet southwest of the road, in a wooded area; Essex USGS topographic quadrangle; lat. 36 degrees 13 minutes 18 seconds N. and long. 77 degrees 56 minutes 44 seconds W.

Ap—0 to 6 inches; strong brown (7.5YR 4/6) silty clay loam; few fine distinct yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; friable; many fine and medium roots; very strongly acid; abrupt smooth boundary.

Bt1—6 to 20 inches; red (2.5YR 5/8) silty clay; few fine distinct brownish yellow (10YR 6/8) mottles; moderate medium subangular blocky structure; friable; common fine roots; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt2—20 to 35 inches; red (2.5YR 5/8) silty clay; common medium distinct brownish yellow (10YR 6/8) mottles; moderate medium subangular blocky structure; friable; common distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

C—35 to 50 inches; mottled yellow (10YR 7/6), light gray (10YR 7/1), weak red (10R 5/4), and red (2.5YR 5/8) saprolite of silt loam; massive; friable; very strongly acid; clear smooth boundary.

Cr—50 to 62 inches; mottled light gray (10YR 7/1) and red (2.5YR 5/8) strongly weathered slate rock that crushes to silty soil material; rock controlled structure; firm in place, friable when dug; very strongly acid.

The thickness of the solum ranges from 30 to 60 inches. The depth to soft bedrock ranges from 40 to 60 inches (fig. 23). The soils are strongly acid or very strongly acid unless limed.

The Ap horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 to 8. It is silty clay loam or silt loam.

The A horizon, if it occurs, has hue of 7.5YR or 10YR, value of 3 to 6, and chroma of 2 to 4. It is silty clay loam or silt loam.

The E horizon, if it occurs, has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 3 to 6. It is silt loam, loam, or fine sandy loam.

The BE horizon, if it occurs, has hue of 2.5YR to 10YR, value of 4 to 6, and chroma of 3 to 8. It is silt loam, loam, silty clay loam, or clay loam.

The Bt horizon has hue of 10R or 2.5YR, value of 4 or 5, and chroma of 6 to 8. Mottles in shades of red, brown, or yellow may occur. Texture is clay loam, clay, silty clay, or silty clay loam.

The BC horizon, if it occurs, has hue of 10R to 5YR, value of 4 to 6, and chroma of 4 to 8. It is clay loam, silty clay loam, silty clay, or clay.

The C horizon has hue of 10R to 5YR, value of 4 to 6, and chroma of 4 to 8, or it is mottled. It is saprolite that has texture of silt loam, loam, clay loam, silty clay loam, silty clay, or clay.

Tomotley Series

The Tomotley series consists of poorly drained soils that formed in loamy fluvial sediments. Slopes range from 0 to 2 percent. These soils are fine-loamy, mixed, thermic Typic Endoaquults.

Typical pedon of Tomotley fine sandy loam, 0 to 2 percent slopes, rarely flooded; about 0.6 mile north of North Carolina Highway 561 on U.S. Highway 258, about 75 feet west of the road, in a field; Scotland Neck USGS topographic quadrangle; lat. 36 degrees 12 minutes 01 second N. and long. 77 degrees 23 minutes 28 seconds W.

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; many very fine and fine and few medium roots; slightly acid; clear wavy boundary.

BA—5 to 9 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak medium subangular blocky structure; friable; many fine and medium roots; few fine faint dark gray (10YR 4/1) iron depletions and few fine distinct strong brown (7.5YR 5/8) masses of iron accumulation; slightly acid; gradual wavy boundary.

Btg1—9 to 23 inches; light gray (10YR 7/1) clay loam; moderate medium subangular blocky structure; friable; slightly sticky, slightly plastic; common distinct clay films on faces of peds; common medium distinct yellowish brown (10YR 5/8) and few fine distinct strong brown (7.5YR 5/8) masses of iron accumulation; moderately acid; gradual wavy boundary.

Btg2—23 to 31 inches; gray (10YR 5/1) clay loam; moderate medium subangular blocky structure; friable; slightly sticky, slightly plastic; common distinct clay films on faces of peds; common medium distinct yellowish brown (10YR 5/8) masses of iron accumulation; strongly acid; gradual wavy boundary.

BCg—31 to 40 inches; gray (10YR 5/1) sandy loam that has pockets of sandy clay loam; weak medium subangular blocky structure; friable; many medium distinct yellowish brown (10YR 5/8) masses of iron accumulation; strongly acid; gradual wavy boundary.

Cg1—40 to 45 inches; gray (10YR 5/1), yellow (10YR 7/6), and yellowish brown (10YR 5/8) fine sandy loam; massive; very friable; areas with gray colors are iron depletions and areas with yellow and brown colors are iron accumulations; very strongly acid; gradual wavy boundary.

Cg2—45 to 51 inches; light gray (10YR 7/1) loamy sand; single grained; loose; few fine distinct yellow (10YR 7/6) and common fine distinct yellowish brown (10YR 5/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Cg3—51 to 60 inches; light gray (10YR 7/1) sand; single grained; loose; very strongly acid.

The thickness of the solum ranges from 30 to more than 60 inches. The soils are moderately acid to extremely acid unless limed.

The Ap or A horizon has hue of 10YR to 5Y or is neutral in hue and has value of 2 to 4 and chroma of 0 to 2.

The Eg horizon, if it occurs, has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. It is loamy sand, loamy fine sand, sandy loam, fine sandy loam, loam, or silt loam.

The BA or BEg horizon has hue of 10YR or 2.5Y or is neutral in hue and has value of 4 to 7 and chroma of 0 to 2. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is sandy loam, fine sandy loam, loam, or silt loam.

The Btg horizon has hue of 10YR to 5Y or is neutral in hue and has value of 4 to 7 and chroma of 0 to 2. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is dominantly sandy loam, fine sandy loam, loam, sandy clay loam, or clay loam. It can range to sandy clay or clay below a depth of 40 inches.

The BCg horizon has hue of 10YR to 5Y or is neutral in hue and has value of 4 to 7 and chroma of 0 to 2. Masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is fine sandy loam, sandy loam, loam, sandy clay loam, clay loam, silt loam, or sandy clay.

The Cg horizon has hue of 10YR to 5Y or is neutral in hue and has value of 4 to 7 and chroma of 0 to 2. Masses of iron accumulation in shades of red, yellow, or brown may occur. Texture ranges from sand to clay.

Turbeville Series

The Turbeville series consists of well drained soils that formed in clayey fluvial sediments. Slopes range from 2 to 6 percent. These soils are clayey, mixed, thermic Typic Kandiudults.

Typical pedon of Turbeville fine sandy loam, 2 to 6 percent slopes; about 2.0 miles south of Weldon on U.S. Highway 301, about 0.2 mile east on a farm path, about 100 feet south of the farm path, in a field; Weldon USGS topographic quadrangle; lat. 36 degrees 23 minutes 15 seconds N. and long. 77 degrees 35 minutes 28 seconds W.

Ap—0 to 9 inches; brown (7.5YR 5/3) fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; neutral; abrupt smooth boundary.

BE—9 to 12 inches; mottled strong brown (7.5YR 5/6) and yellowish red (5YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; common fine roots; slightly acid; clear wavy boundary.

Bt1—12 to 17 inches; red (2.5YR 4/8) clay loam; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; common fine roots; few distinct clay films on faces of peds; strongly acid; clear wavy boundary.

Bt2—17 to 24 inches; red (2.5YR 4/8) clay; moderate medium subangular blocky structure; friable; moderately sticky, slightly plastic; few fine roots; common distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt3—24 to 44 inches; red (2.5YR 4/8) clay; few medium distinct brown (7.5YR 5/4) mottles; moderate medium subangular blocky structure; friable; very sticky, moderately plastic; few fine roots; common distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt4—44 to 59 inches; dark red (10R 3/6) clay; moderate medium subangular blocky structure; friable; very sticky, moderately plastic; few fine roots; common distinct clay films on faces of peds; strongly acid; clear wavy boundary.

Bt5—59 to 86 inches; dark red (10R 3/6) clay; common medium prominent strong brown (7.5YR

5/6) mottles; moderate medium subangular blocky structure; friable; moderately sticky, moderately 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. The soils are strongly acid or very strongly acid unless limed.

The Ap or A horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 2 to 4.

The E horizon, if it occurs, has hue of 5YR to 10YR, value of 5 to 7, and chroma of 4 to 8. It is fine sandy loam, sandy loam, loam, or silt loam.

The BE or BA horizon has hue of 2.5YR to 10YR, value of 4 to 6, and chroma of 4 to 8. It is fine sandy loam, loam, sandy clay loam, or clay loam.

The upper part of the Bt horizon has hue of 2.5YR to 10YR, value of 4 to 6, and chroma of 4 to 8. The lower part has hue of 10R to 5YR, value of 3 or 4, and chroma of 4 to 8. Texture is sandy clay loam, clay loam, clay, or sandy clay.

Udorthents

Soils classified as Udorthents are a mixture of natural soils. They are well drained and moderately well drained. Slopes range from 0 to 10 percent.

A typical pedon is not given for Udorthents because of the variable nature of the soils.

The thickness of the solum ranges from 40 to more than 60 inches. Redoximorphic features, which are associated with seasonal wetness, occur within a depth of 48 to 60 inches. The soils are strongly acid to extremely acid unless limed.

Most horizons have hue of 5YR to 10YR, value of 4 to 7, and chroma of 2 to 8. Texture is variable and commonly loamy.

Wahee Series

The Wahee series consists of somewhat poorly drained soils that formed in clayey fluvial sediments. Slopes range from 0 to 2 percent. These soils are clayey, mixed, thermic Aeric Endoaquults.

Typical pedon of Wahee silt loam, 0 to 2 percent slopes, rarely flooded; about 1.5 miles east of Pender on North Carolina Highway 561, about 0.2 mile south on a logging road, about 50 feet west of the logging road, in a wooded area; Halifax USGS topographic quadrangle; lat. 36 degrees 17 minutes 57 seconds N. and long. 77 degrees 34 minutes 13 seconds W.

A—0 to 3 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; very friable; many very fine, fine, and medium roots; strongly acid; clear wavy boundary.

E—3 to 7 inches; light yellowish brown (10YR 6/4) silt loam; weak fine granular structure; very friable; common very fine, many fine and medium, and few coarse roots; strongly acid; clear wavy boundary.

Bt1—7 to 13 inches; light yellowish brown (2.5Y 6/4) clay loam; moderate medium subangular blocky structure; friable; slightly sticky, slightly plastic; few medium and coarse roots; few faint clay films on faces of peds; common medium distinct light gray (2.5Y 7/2) iron depletions and common medium distinct reddish yellow (7.5YR 6/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Bt2—13 to 31 inches; light yellowish brown (2.5Y 6/4), light brownish gray (2.5Y 6/2), reddish yellow (7.5YR 6/8), and red (2.5YR 5/8) clay; moderate medium subangular blocky structure; firm; slightly sticky, slightly plastic; common distinct clay films on faces of peds; areas with gray colors are iron depletions and areas with yellow, red, and brown colors are iron accumulations; very strongly acid; gradual wavy boundary.

Btg—31 to 48 inches; light brownish gray (2.5Y 6/2) clay; moderate medium subangular blocky structure; firm; slightly sticky, slightly plastic; common distinct clay films on faces of peds; common medium distinct reddish yellow (7.5YR 6/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Cg—48 to 60 inches; light brownish gray (2.5Y 6/2) clay; massive; very firm; slightly sticky, slightly plastic; common medium distinct reddish yellow (7.5YR 6/8) masses of iron accumulation; very strongly acid.

The thickness of the solum ranges from 40 to more than 60 inches. The soils are strongly acid to extremely acid unless limed.

The Ap or A horizon has hue of 10YR or 2.5Y or is neutral in hue and has value of 2 to 5 and chroma of 0 to 3.

The E horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 2 to 4. It is loam, silt loam, very fine sandy loam, fine sandy loam, or sandy loam.

The Bt horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 3 to 8. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is sandy clay loam, clay loam, clay, sandy clay, or silty clay.

The Btg horizon has hue of 10YR to 5Y or is neutral in hue and has value of 4 to 7 and chroma of 0 to 2.

Masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is clay loam, clay, sandy clay, or silty clay.

The Cg horizon has hue of 10YR to 5Y or is neutral in hue and has value of 5 to 7 and chroma of 0 to 2. Masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is sandy loam, clay loam, clay, or silty clay loam.

Wedowee Series

The Wedowee series consists of well drained soils that formed in material weathered from porphyritic granite and other felsic crystalline rock. Slopes range from 2 to 25 percent. These soils are clayey, kaolinitic, thermic Typic Kanhapludults.

Typical pedon of Wedowee sandy loam, 2 to 6 percent slopes; about 1.9 miles northwest of North Carolina Highway 48 on Secondary Road 1001, about 0.4 mile south on a farm path, about 0.1 mile southeast of the farm path, in a field; Aurelian Springs USGS topographic quadrangle; lat. 36 degrees 22 minutes 16 seconds N. and long. 77 degrees 50 minutes 20 seconds W.

Ap—0 to 7 inches; dark brown (10YR 4/3) sandy loam; weak medium granular structure; very friable; many fine and medium roots; slightly acid; abrupt smooth boundary.

BE—7 to 10 inches; yellowish brown (10YR 5/6) sandy loam; weak medium subangular blocky structure; friable; many fine and medium roots; slightly acid; abrupt smooth boundary.

Bt1—10 to 19 inches; strong brown (7.5YR 5/6) clay; few fine distinct yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; friable; common fine and medium roots; few distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt2—19 to 26 inches; strong brown (7.5YR 5/6) clay; common medium distinct brownish yellow (10YR 6/8) and many coarse distinct red (2.5YR 4/8) mottles; moderate medium subangular blocky structure; friable; few fine roots; few distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

BC—26 to 36 inches; strong brown (7.5YR 5/6) clay loam; common medium distinct brownish yellow (10YR 6/8), common medium distinct white (5YR 8/1), and many coarse distinct red (2.5YR 4/8) mottles; weak medium subangular blocky structure; friable; few fine roots; strongly acid; gradual wavy boundary.

C—36 to 63 inches; mottled strong brown (7.5YR 5/6), brownish yellow (10YR 6/8), pink (5YR 7/4), white (5YR 8/1), and red (2.5YR 4/8) saprolite of sandy clay loam; massive; friable; very strongly acid.

The thickness of the solum ranges from 20 to 40 inches. The soils are strongly acid or extremely acid unless limed.

The Ap or A horizon has hue of 7.5YR to 2.5Y, value of 3 to 6, and chroma of 2 to 8.

The E horizon, if it occurs, has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 3 to 6. It is coarse loamy sand, coarse sandy loam, sandy loam, fine sandy loam, or loam.

The BE horizon has hue of 5YR to 10YR, value of 4 to 7, and chroma of 3 to 8. It is coarse sandy loam, fine sandy loam, sandy loam, loam, sandy clay loam, or clay loam.

The Bt horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 6 to 8. Mottles in shades of red, brown, or yellow may occur. Texture is sandy clay loam, clay loam, clay, or sandy clay.

The BC horizon has hue of 2.5YR to 10YR, value of 5 to 7, and chroma of 4 to 8. Mottles in shades of red, brown, or yellow may occur. Texture is fine sandy loam, sandy clay loam, loam, or clay loam.

The C horizon is mottled in shades of brown, yellow, or white. It is saprolite that has texture of fine sandy loam, sandy loam, sandy clay loam, loam, clay loam, or sandy clay.

Wehadkee Series

The Wehadkee series consists of poorly drained soils that formed in loamy fluvial sediments. Slopes are 0 to 1 percent. These soils are fine-loamy, mixed, nonacid, thermic Typic Fluvaquents.

Typical pedon of Wehadkee loam in an area of Chewacla and Wehadkee soils, 0 to 1 percent slopes, frequently flooded; about 1.0 mile east-southeast of Norfleet on Secondary Road 1800, about 1.3 miles east-southeast on a farm path, about 2.25 miles south-southwest on the farm path, about 350 feet south-southeast of the farm path, in a wooded area; Palmyra USGS topographic quadrangle; lat. 36 degrees 06 minutes 21 seconds N. and long. 77 degrees 16 minutes 56 seconds W.

A1—0 to 3 inches; grayish brown (2.5Y 5/2) loam; moderate medium subangular blocky structure; friable; common very fine, fine, and medium roots; few fine flakes of mica; common fine prominent strong brown (7.5YR 5/8) and common fine prominent yellowish red (5YR 5/8) masses of iron accumulation; very strongly acid; clear wavy boundary.

A2—3 to 7 inches; grayish brown (2.5Y 5/2) silt loam; weak fine angular blocky structure; friable; common very fine, fine, and medium roots; few fine flakes of mica; few fine distinct dark yellowish brown (10YR 3/6), many medium distinct strong brown (7.5YR 5/8), and common fine prominent red (2.5YR 4/6) masses of iron accumulation; strongly acid; clear wavy boundary.

Bg1—7 to 21 inches; light brownish gray (2.5Y 6/2) silty clay loam; moderate medium subangular blocky structure; friable; moderately sticky, nonplastic; common very fine, fine, and medium roots; few fine flakes of mica; many medium distinct dark yellowish brown (10YR 3/6) and many medium distinct strong brown (7.5YR 5/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Bg2—21 to 28 inches; gray (N 5/0) clay loam; moderate medium subangular blocky structure; friable; moderately sticky, nonplastic; few fine flakes of mica; common fine distinct strong brown (7.5YR 5/8) and common fine prominent red (2.5YR 4/6) masses of iron accumulation; strongly acid; gradual wavy boundary.

Bg3—28 to 33 inches; gray (N 5/0) clay loam; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; few fine flakes of mica; many medium prominent red (2.5YR 4/6) masses of iron accumulation; strongly acid; gradual wavy boundary.

Cg1—33 to 44 inches; gray (N 5/0) sandy clay loam; massive; friable; nonsticky, nonplastic; few fine flakes of mica; many medium distinct yellowish brown (10YR 5/8) masses of iron accumulation; slightly acid; gradual wavy boundary.

Cg2—44 to 50 inches; gray (N 5/0) sandy loam; massive; friable; nonsticky, nonplastic; few fine flakes of mica; neutral; gradual wavy boundary.

Cg3—50 to 60 inches; gray (N 5/0) sandy clay loam; massive; friable; nonsticky, nonplastic; few fine flakes of mica; neutral.

The thickness of the solum ranges from 20 to more than 60 inches. The soils are neutral to very strongly acid unless limed.

The A horizon has hue of 10YR or 2.5Y or is neutral in hue and has value of 4 to 6 and chroma of 0 to 4.

The Bg horizon has hue of 10YR to 5Y or is neutral in hue and has value of 4 to 6 and chroma of 0 to 2. Masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is sandy clay loam, loam, clay loam, silty clay loam, or silt loam.

The Cg horizon has hue of 10YR to 5Y or is neutral in hue and has value of 4 to 7 and chroma of 0 to 2. Masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is dominantly sandy loam, sandy clay loam, loam, clay loam, or silty clay loam. It can range to sand or loamy sand below a depth of 40 inches.

Winton Series

The Winton series consists of moderately well drained soils that formed in loamy sediments on coastal plains. Slopes range from 25 to 45 percent. These soils are fine-loamy, mixed, thermic Aquic Hapludults.

Typical pedon of Winton fine sandy loam, 25 to 45 percent slopes; about 0.4 mile northeast of North Carolina Highway 301 (business) on Dobbs Street in Halifax, about 100 feet north of the road, in a wooded area; Halifax USGS topographic quadrangle; lat. 36 degrees 20 minutes 08 seconds N. and long. 77 degrees 35 minutes 19 seconds W.

A—0 to 5 inches; very dark grayish brown (10YR 3/2) fine sandy loam; moderate medium granular structure; friable; many fine and few coarse roots; strongly acid; abrupt smooth boundary.

E—5 to 9 inches; pale brown (10YR 6/3) fine sandy loam; moderate medium granular structure; friable; many fine and few coarse roots; strongly acid; clear wavy boundary.

Bt1—9 to 14 inches; pale yellow (2.5Y 7/4) sandy clay loam; moderate medium subangular blocky structure; friable; few coarse roots; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt2—14 to 23 inches; brownish yellow (10YR 6/6) sandy clay loam; moderate medium subangular blocky structure; friable; few coarse roots; few faint clay films on faces of peds; few medium distinct strong brown (7.5YR 5/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Bt3—23 to 38 inches; brownish yellow (10YR 6/6) clay loam; moderate medium subangular blocky structure; friable; few coarse roots; few faint clay films on faces of peds; common medium distinct gray (10YR 6/1) iron depletions and common medium distinct strong brown (7.5YR 5/8) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Bt4—38 to 57 inches; brownish yellow (10YR 6/6), gray (10YR 6/1), and strong brown (7.5YR 5/8) clay loam; weak medium subangular blocky structure; friable; few coarse roots; few faint clay films on faces of peds; areas with gray colors are iron depletions and areas with yellow and brown

colors are iron accumulations; very strongly acid; gradual wavy boundary.

BC—57 to 63 inches; strong brown (7.5YR 5/8) and light gray (N 7/0) sandy clay loam that has pockets of sandy loam; weak medium subangular blocky structure; friable; areas with gray colors are iron depletions and areas with brown colors are iron accumulations; very strongly acid.

The thickness of the solum ranges from 40 to more than 60 inches. The soils range from moderately acid to extremely acid.

The A horizon has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 1 to 4.

The E horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 2 to 6. It is loamy sand, loamy fine sand, fine sandy loam, sandy loam, or loam.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 2 to 8. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is fine sandy loam, sandy loam, sandy clay loam, or clay loam.

The BC horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 2 to 8. Iron depletions with chroma of 2 or less and masses of iron accumulation in shades of red, yellow, or brown may occur. Texture is loamy sand, loamy fine sand, fine sandy loam, sandy loam, or sandy clay loam.

The C horizon, if it occurs, has hue of 10YR or 2.5Y and value and chroma of 3 to 8. Mottles, iron accumulations, or depletions in shades of red, yellow, gray, or brown may occur. Texture ranges from sand to clay.

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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.

Amphibolite. A metamorphic rock consisting mainly of amphibole and plagioclase with little or no quartz. As the content of quartz increases, the rock grades into hornblende plagioclase gneiss.

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.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

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.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

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 plasticity index (PI), 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

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Basalt. A fine grained igneous rock dominated by dark minerals, consisting of more than 50 percent plagioclase feldspars with the balance being ferromagnesian silicates. Basalts and andesites represent about 98 percent of all extrusive rocks.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

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.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Borrow pit. An open excavation from which the soil and underlying material have been removed,

generally for use in road construction. Borrow pits support few or no plants without major reclamation. Areas identified on the detailed soil maps by a special symbol typically are less than 2 acres in size.

Bottom land. The normal flood plain of a stream, subject to flooding.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Broad-base terrace. A ridge-type terrace built to control erosion by diverting runoff along the contour at a nonscouring velocity. The terrace is 10 to 20 inches high and 15 to 30 feet wide. It has gently sloping sides, a rounded crown, and a dish-shaped channel along the upper side. It may be nearly level or have a grade toward one or both ends.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but 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.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

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.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

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.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Clod. See Aggregate, soil.

CMAI (cumulative mean annual increment). The age or rotation at which growing stock of a forest produces the greatest annual growth (for that time period). It is the age at which periodic annual growth and mean annual growth are equal.

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-loamy. According to family level criteria in the soil taxonomic system, soil containing less than 18 percent clay, by weight, and 15 percent or more fine sand or coarser textured material.

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 sediments are in level to rolling areas and vary in thickness.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

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. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane that typically takes the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common

compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

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.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

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.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, content of organic matter, and fertility and helps to control erosion.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Crust. A thin, hard layer of soil material that forms on the surface in cultivated areas as the result of fine soil material settling out of ponding.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

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 4.5 feet above the ground level on the uphill side.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Delineation. The process of drawing or plotting features on a map with lines and symbols.

Denitrification. The biochemical reduction of nitrate or nitrite to gaseous nitrogen either as molecular nitrogen or as an oxide of nitrogen.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depression (depressional area). A portion of land surrounded on all sides by higher land. These areas generally do not have outlets for drainage.

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

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

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 wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. 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, 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, 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, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Engineering index test data. Laboratory test and mechanical analysis of selected soils in the county.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Eroded (soil phase). Because of erosion, these soils have lost an average of 25 to 75 percent of the original A horizon or the uppermost 2 to 6 inches if the original A horizon was less than 8 inches thick.

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 a fire, that exposes the surface.

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 areas, 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 cultivated 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 metric tons per hectare (values determined by the Universal Soil Loss Equation assuming bare soil conditions and using rainfall and climate factors for North Carolina):

0 tons per hectare	none
Less than 2.5 tons per hectare	slight
2.5 to 10 tons per hectare	moderate
10 to 25 tons per hectare	severe
More than 25 tons per hectare	very severe

Evapotranspiration. The combined loss of water from a given area through surface evaporation and through transpiration by plants during a specified period.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Fall Line. The boundary between the Coastal Plain and Piedmont physiographic regions. The line is a zone of transition and varies considerably in width. The uplands are commonly sediments of the Coastal Plain, and the bottom of stream channels is hard rock of the Piedmont. The prevalence of falls in the rocky channels prompted the term “fall line.”

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake (in tables). The movement of water into the soil is rapid.

Felsic rock. A general term for light-colored igneous rock and some metamorphic crystalline rock that have an abundance of quartz, feldspars, feldspathoids, and muscovite mica.

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 border. A strip of perennial vegetation (trees, shrubs, or herbaceous plants) established on the edge of a field to control erosion, provide travel lanes for farm machinery, control competition from adjacent woodland, or provide food and cover for wildlife.

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*.

Fine-loamy. According to family level criteria in the soil taxonomic system, soil containing 18 to 35 percent clay, by weight, and 15 percent or more fine sand or coarser textured material.

Fine textured soil. Sandy clay, silty clay, or clay.

Firebreak. An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flat. A general term for a level or nearly level surface or small area of land marked by little or no relief.

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 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). 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.

Foot slope. The inclined surface at the base of a hill.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Geomorphic surface. A part of the surface of the land that represents a episode of landscape development and consists of one or more landforms. It is a mappable part of the land surface that is defined in terms of morphology (relief, slope, aspect etc.); origin (erosional, constructional, etc.); age (absolute or relative); and stability of component landforms.

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.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

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.

Gravel pit. An open excavation from which the soil and underlying material are mined as a source of sand and gravel. The excavated material is used without crushing. Areas identified on the detailed soil maps by a special symbol typically are less than 2 acres in size.

Gravelly soil material. Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Gravelly spot. An area where the content of rock fragments that are mostly less than 3 inches in diameter is more than 15 percent, by volume, in the surface layer, occurring in a map unit in which the surface layer of the dominant soil or soils has less than 15 percent gravel. Areas identified on the detailed soil maps by a special symbol typically are less than 2 acres in size.

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. Water filling all the unblocked pores of the material below the water table.

Gully. A very small channel with steep sides cut by running water and through which water ordinarily runs only after rainfall. A gully generally is an obstacle to wheeled vehicles and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage. Areas identified on the detailed soil maps by a special symbol typically are less than 2 acres in size.

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.

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 (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

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, an Arabic numeral, commonly a 2, precedes the letter C.

Cr layer.—Soft, consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but can be directly below an A or a B horizon.

R layer.—Hard, consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

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.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Intermittent stream. A stream, or reach of a stream, that does not flow year-round.

Intermittent water. An area where water is artifically impounded or a beaver pond or other area where water is impounded because of animal activity. Areas identified on the detailed soil maps by a special symbol typically are 2 to 50 acres in size.

Interstream divide (or 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.

Iron depletions. Low-chroma zones that have a low content of iron and manganese oxide because of

chemical reduction and removal but also have a content of clay similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. Application of water to soils to assist in the production of crops.

Kaolinite. An aluminosilicate clay mineral with a 1:1 layer structure; that is, a silicon tetrahedral sheet alternating with an aluminium octahedral sheet. Little or no expansion occurs when water mixes with the clay.

Lamellae. Very thin, mostly horizontal layers of accumulated clay, iron, or other material common in some sands or loamy sands; associated with soil formation rather than geologic deposition.

Landfill. An area of accumulated waste products from human habitat. Landfill areas can be above or below the natural ground level. Areas identified on the detailed soil maps by a special symbol typically are less than 2 acres in size.

Landform. The description of a given terrain based on position and configuration. Examples are flood plain, stream terrace, fan, mountain slope, and ridge.

Landform position. A particular place within a landform. Examples are summit of a ridge, shoulder of a ridge, nose slope, side slope, back slope, and foot slope.

Landscape. A collection of related, natural landforms; usually the land surface which can be seen in a single view.

Land shaping. The practice of scraping higher convex areas into lower concave areas in order to establish a nearly level field and reduce ponding.

Leaching. The removal of soluble material from soil or other material by percolating water.

Levees. Small dikes, generally less than 50 feet wide and several hundred feet in length, used to prevent intrusions of brackish water or to retain fresh water. Areas identified on the detailed soil maps by a special symbol typically are 5 to 20 acres in size.

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.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mean annual increment. The average yearly volume of a stand of trees from the year of origin to the age under consideration.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

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.

Mine or quarry (map symbol). An open excavation from which the soil and underlying material have been removed, exposing bedrock, or the surface opening to underground mines. Areas identified on the detailed soil maps by a special symbol typically are less than 2 acres in size.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Montmorillonite. An aluminosilicate clay mineral with 2:1 layer structure; that is, two silicon tetrahedral sheets enclosing an aluminium octahedral sheet. Considerable expansion may occur when water mixes with the clay.

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. 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.

Narrow-base terrace. A terrace no more than 4 to 8 feet wide at the base. A narrow-base terrace is similar to a broad-base terrace, except for the width of the ridge and channel.

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

Nose slope. The downward-sloping convex end of a main ridge or spur ridge.

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. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

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, *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.

Perennial stream. A stream, or reach of a stream, that flows continuously throughout the year.

Perennial water. An area that generally provides water for human or livestock consumption; commonly a lake, pond, river, or stream.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as “saturated hydraulic conductivity,” which is defined in the “Soil Survey Manual.” In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as “permeability.” Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 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 flooding.

Phenocryst. A crystal significantly larger than the crystals of surrounding minerals.

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.

Pits (mine or quarry). A small borrow area or pit (usually less than 5 acres in size) where soil, gravel, or stone has been removed.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range in moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to 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 also exposed 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 or very 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.

Porphyritic. A textural term for igneous rocks in which larger crystals, called phenocrysts, are set in a finer groundmass. The groundmass may be crystalline or glassy, or both.

Potential native plant community. See Climax plant community.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate weather conditions and soil moisture conditions and at the proper time of day.

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.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproductive capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

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	less than 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
Slightly 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

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Reforestation. The process in which tree seedlings are planted or become naturally established in an area that was once forested.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

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 generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. Rippable bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 drawbar horsepower rating.

Rock outcrop. An area of exposed bedrock in a map unit that has less than 0.1 percent exposed bedrock. Areas identified on the detailed soil maps by a special symbol typically are less than 2 acres in size.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant 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 and 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 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 generally are moderately steep or steep and have moderate to 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 ranging 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.

Sandy spot. An area where the surface layer is sandy (loamy sand or sand) in a map unit in which the dominant soil or soils have a loamy, silty, or clayey surface layer. Excluded are areas where the textural classes are adjoining, such as an area of loamy sand in a map unit in which the dominant soil or soils have a surface layer of sandy loam. Areas identified on the detailed soil maps by a special symbol typically are less than 2 acres in size.

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 genetically developed soil and grading to bedrock below.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Scarp (marine). An area having a short, steep slope

of considerable linear extent along the transition line dividing marine terraces.

Schist. A metamorphic rock dominated by fibrous or platy minerals. It has schistose cleavage and is a product of regional metamorphism.

Second bottom. The first stream terrace above the normal flood plain (or first bottom) of a river.

Seepage (in tables). The movement of water through the soil. Seepage 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. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Severely eroded spot. An area of soil that has lost an average of 75 percent or more of the original surface layer because of accelerated erosion, occurring in a map unit in which the dominant soil or soils have lost less than 25 percent of the original surface layer. Areas identified on the detailed soil maps by a special symbol typically are less than 2 acres in size.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Short, steep slope. An area of soil that is at least two slope classes steeper than the named soils in the surrounding map unit. Areas identified on the detailed soil maps by a special symbol typically are long, narrow bands that are less than 2 acres in size. (See Slope.)

Shrink-swell (in tables). 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.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

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.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

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.

Skidding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most systems involve pulling the trees with wire cables attached to a bulldozer or rubber-tired tractor. Generally, felled trees are skidded or pulled with one end lifted to reduce friction and soil disturbance.

Skid trails. The paths left from skidding logs and the bulldozer or tractor used to pull them.

Slate. A fine grained metamorphic rock with well developed slaty cleavage. Formed by the low-grade regional metamorphism of shale.

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, classes for simple slopes are as follows:

Nearly level	0 to 2 percent
Gently sloping	2 to 6 percent
Moderately sloping	6 to 10 percent
Strongly sloping	10 to 15 percent
Moderately steep	15 to 25 percent
Steep	25 to 45 percent

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

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.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

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. 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.

Soil map units generally are designed to reflect significant differences in use and management among the soils of a survey area.

Soil puddling. This condition occurs in certain soils when they are driven over while they are wet. Exertion of mechanical force destroys the soil structure by compressing and shearing and results in the rearrangement of the soil particles to a massive or nonstructural state.

Soil sample site (map symbol). The location of a typifying pedon in the survey area.

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 material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stand density. The degree to which an area is covered with living trees. It is usually expressed in units of basal area per acre, number of trees per acre, or the percentage of ground covered by the tree canopy as viewed from above.

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. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

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.”

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Textural classes (general). Broad textural groups that describe the dominant fine-earth fraction (particles less than 2 millimeters in size) of the subsoil or the layers beneath the surface layer to a depth of about 1 meter or to bedrock if the soil is less than 1 meter thick.

Clayey.—A general textural term that includes sandy clay, silty clay, and clay.

Loamy.—A general textural term that includes very coarse sandy loam, coarse sandy loam, sandy loam, fine sandy loam, very fine sandy loam, loam, sandy clay loam, and clay loam.

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.

Silty.—A general textural term that includes silt, silt loam, and silty clay loam.

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 $1^1/_2$ 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, the content of sand is 85 to 90 percent and the percentage of silt plus $1^1/_2$ times the percentage of clay is not less than 15 and, 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 percent or more 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 percent or more 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 percent or more 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 percent or more clay and 45 percent or more sand.

Silty clay.—Soil material that contains 40 percent or more clay and 40 percent or more silt.

Clay.—Soil material that contains 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Thin layer (in tables). 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.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topography. The relative positions and elevations of the natural or manmade features of an area that describe the configuration of its surface.

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, for example, 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 systems for the control of water erosion: 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. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and to divert water off and away from the road surface. Water bars can easily be driven over if constructed properly.

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 in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wetness. A general term applied to soils that hold water at or near the surface long enough to be a common management problem.

Wet spot. An area of somewhat poorly drained to very poorly drained soils that are at least two drainage classes wetter than the named soils in the surrounding map unit. Areas identified on the detailed soil maps by a special symbol typically are less than 2 acres in size. (See Drainage class.)

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

Yield (forest land). The volume of wood fiber from harvested trees taken from a certain unit of area. Yield is usually measured in board feet or cubic feet per acre.

Tables

Table 1.—Temperature and Precipitation

(Recorded in the period 1961-90 at Arcola, North Carolina)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	o F	o F	o F	o F	o F	Units	In	In	In		In
January-----	48.3	28.4	37.0	73	4	16	3.52	2.31	4.74	6	1.6
February----	51.7	31.2	40.2	76	8	29	3.65	1.88	5.21	6	2.7
March-------	61.4	37.6	48.9	84	18	100	3.90	2.46	5.01	7	1.3
April-------	71.5	45.5	57.7	90	26	246	3.12	1.55	4.27	5	.0
May---------	78.5	54.0	66.0	93	34	445	3.98	2.14	5.55	6	.0
June--------	85.4	61.7	73.4	97	45	695	3.92	2.10	5.52	5	.0
July--------	88.6	66.1	77.3	99	52	818	4.40	2.24	6.28	6	.0
August------	87.3	65.5	76.3	98	49	785	4.83	2.47	6.90	7	.0
September---	81.9	58.9	70.1	95	41	561	3.36	1.30	5.05	4	.0
October-----	71.5	47.0	59.0	87	26	281	3.25	1.15	4.95	4	.0
November----	63.1	39.6	50.5	81	18	116	3.34	1.59	4.79	4	.1
December----	52.2	31.9	41.8	75	9	34	3.28	1.73	4.76	6	.5
Yearly:											
Average---	70.1	47.3	58.2	---	---	---	---	---	---	---	---
Extreme---	---	---	---	100	2	---	---	---	---	---	---
Total-----	---	---	---	---	---	4,125	44.55	37.15	49.03	66	6.2

* 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 1961-90 at Arcola, 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--	Apr. 1	Apr. 14	Apr. 28
2 years in 10 later than--	Mar. 26	Apr. 9	Apr. 23
5 years in 10 later than--	Mar. 16	Mar. 30	Apr. 13
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 31	Oct. 17	Oct. 9
2 years in 10 earlier than--	Nov. 7	Oct. 23	Oct. 13
5 years in 10 earlier than--	Nov. 19	Nov. 4	Oct. 22

Table 3.—Growing Season

(Recorded in the period 1961-90 at Arcola, 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	215	192	171
8 years in 10	222	199	178
5 years in 10	236	214	191
2 years in 10	250	228	204
1 year in 10	258	236	211

Table 4.—Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
AaA	Altavista fine sandy loam, 0 to 3 percent slopes, rarely flooded	7,975	1.7
AyA	Aycock silt loam, 0 to 3 percent slopes	2,400	0.5
BaA	Bethera loam, 0 to 1 percent slopes	4,095	0.9
BcA	Bojac loamy fine sand, 0 to 3 percent slopes	930	0.2
BoB	Bonneau loamy fine sand, 0 to 4 percent slopes	14,235	3.0
CbA	Chastain and Bibb soils, 0 to 1 percent slopes, frequently flooded	39,000	8.2
ChA	Chewacla loam, 0 to 1 percent slopes, occasionally flooded	4,005	0.9
CwA	Chewacla and Wehadkee soils, 0 to 1 percent slopes, frequently flooded	22,170	4.7
DgA	Dogue silt loam, 0 to 3 percent slopes	9,145	2.0
DoA	Dothan loamy sand, 0 to 2 percent slopes	3,690	0.8
DoB	Dothan loamy sand, 2 to 6 percent slopes	4,965	1.1
EmA	Emporia fine sandy loam, 0 to 2 percent slopes	18,385	3.9
EmB	Emporia fine sandy loam, 2 to 6 percent slopes	25,595	5.4
EmC	Emporia fine sandy loam, 6 to 10 percent slopes	3,335	0.7
ErB	Emporia-Urban land complex, 0 to 6 percent slopes	6,445	1.4
EwB	Emporia-Wedowee complex, 2 to 6 percent slopes	26,397	5.5
ExA	Exum silt loam, 0 to 2 percent slopes	8,045	1.7
FuB	Fuquay sand, 0 to 4 percent slopes	6,075	1.3
GoA	Goldsboro fine sandy loam, 0 to 2 percent slopes	21,555	4.6
GrA	Grantham loam, 0 to 1 percent slopes	10,105	2.2
GtB	Gritney fine sandy loam, 2 to 6 percent slopes	14,290	3.1
GtC	Gritney fine sandy loam, 6 to 10 percent slopes	3,075	0.7
GyB2	Gritney sandy clay loam, 2 to 6 percent slopes, eroded	3,700	0.8
HeA	Helena sandy loam, 0 to 3 percent slopes	3,605	0.8
HrB	Herndon silt loam, 2 to 6 percent slopes	5,430	1.2
HrC	Herndon silt loam, 6 to 10 percent slopes	1,780	0.4
LgA	Lignum silt loam, 0 to 3 percent slopes	4,635	1.0
LyA	Lynchburg fine sandy loam, 0 to 2 percent slopes	7,255	1.6
MrA	Marlboro fine sandy loam, 0 to 2 percent slopes	1,685	0.4
MrB	Marlboro fine sandy loam, 2 to 6 percent slopes	4,120	0.9
NaA	Nahunta silt loam, 0 to 2 percent slopes	4,675	1.0
NkB	Nankin gravelly loamy sand, 1 to 6 percent slopes	2,620	0.6
NoA	Noboco fine sandy loam, 0 to 2 percent slopes	3,785	0.8
PaB	Pacolet sandy loam, 2 to 6 percent slopes	11,740	2.5
PeB2	Pacolet sandy clay loam, 2 to 6 percent slopes, eroded	3,125	0.7
RaA	Rains fine sandy loam, 0 to 1 percent slopes	14,335	3.1
RmA	Riverview loam, 0 to 1 percent slopes, occasionally flooded	4,195	0.9
RoA	Roanoke loam, 0 to 2 percent slopes, occasionally flooded	11,190	2.4
SeA	Seabrook loamy sand, 0 to 2 percent slopes, rarely flooded	740	0.2
StA	State fine sandy loam, 0 to 2 percent slopes	18,860	4.0
StB	State fine sandy loam, 2 to 6 percent slopes	7,335	1.6
TaA	Tarboro loamy sand, 0 to 3 percent slopes	1,155	0.2
TbE	Tatum silt loam, 10 to 25 percent slopes	2,820	0.6
TmB2	Tatum silty clay loam, 2 to 6 percent slopes, eroded	10,770	2.3
TmC2	Tatum silty clay loam, 6 to 10 percent slopes, eroded	2,420	0.5
TtA	Tomotley fine sandy loam, 0 to 2 percent slopes, rarely flooded	4,685	1.0
TuB	Turbeville fine sandy loam, 2 to 6 percent slopes	520	0.1
Ud	Udorthents, loamy	1,525	0.3
WaA	Wahee silt loam, 0 to 2 percent slopes, rarely flooded	5,110	1.1
WeB	Wedowee sandy loam, 2 to 6 percent slopes	36,370	7.6
WeC	Wedowee sandy loam, 6 to 10 percent slopes	17,360	3.7
WeE	Wedowee sandy loam, 10 to 25 percent slopes	5,415	1.2
WnF	Winton fine sandy loam, 25 to 45 percent slopes	4,290	0.9
	Water areas more than 40 acres in size	3,235	0.7
	Water areas less than 40 acres in size	1,629	0.3
	Total	468,026	100.0

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	Peanuts	Corn	Soybeans	Tobacco	Wheat	Pasture
		Lbs	Lbs	Bu	Bu	Lbs	Bu	AUM*
AaA---------- Altavista	IIw	650	3,600	125	42	3,000	55	8.0
AyA---------- Aycock	IIe	700	3,600	120	40	2,700	60	8.0
BaA---------- Bethera	IIIw	450	2,500	105	35	---	45	6.5
BcA---------- Bojac	IIs	750	2,900	90	30	1,800	40	6.0
BoB---------- Bonneau	IIs	700	2,900	85	30	2,600	45	6.0
CbA:								
Chastain-------	VIIw	---	---	---	---	---	---	6.5
Bibb----------	Vw	---	---	---	---	---	---	6.0
ChA---------- Chewacla	IIIw	---	---	100	35	---	50	6.5
CwA:								
Chewacla-------	IVw	---	---	80	30	---	30	6.5
Wehadkee-------	VIw	---	---	---	---	---	---	8.5
DgA---------- Dogue	IIw	600	2,900	125	45	2,300	60	8.0
DoA---------- Dothan	I	900	3,800	120	40	2,800	50	6.0
DoB---------- Dothan	IIe	900	3,600	120	35	2,600	50	6.0
EmA---------- Emporia	I	650	4,000	110	35	3,000	55	8.0
EmB---------- Emporia	IIe	600	3,700	100	30	2,900	50	8.0
EmC---------- Emporia	IIIe	550	3,200	90	25	2,700	45	8.0
EwB:								
Emporia--------	IIe	600	3,700	100	30	2,900	50	8.0
Wedowee--------	IIe	525	2,500	80	35	2,600	40	8.0
ExA---------- Exum	IIw	750	3,400	125	50	2,800	65	8.0
FuB---------- Fuquay	IIs	650	2,900	85	30	2,400	45	6.0

See footnote 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	Peanuts	Corn	Soybeans	Tobacco	Wheat	Pasture
		Lbs	Lbs	Bu	Bu	Lbs	Bu	AUM*
GoA---------- Goldsboro	IIw	700	3,600	125	42	3,000	60	8.0
GrA---------- Grantham	IIIw	---	---	130	45	---	55	6.5
GtB---------- Gritney	IIIe	600	3,000	90	28	2,500	40	8.0
GtC---------- Gritney	IVe	500	2,600	80	24	2,200	35	8.0
GyB2---------- Gritney	IVe	500	2,600	80	24	2,200	35	7.0
HeA---------- Helena	IIw	575	2,800	85	40	2,000	40	8.0
HrB---------- Herndon	IIe	500	---	95	40	2,200	50	8.0
HrC---------- Herndon	IIIe	500	---	85	35	2,000	40	8.0
LgA---------- Lignum	IIw	---	---	90	40	---	40	6.5
LyA---------- Lynchburg	IIw	675	3,000	115	45	2,800	45	6.5
MrA---------- Marlboro	I	800	3,300	100	40	2,500	60	8.0
MrB---------- Marlboro	IIe	720	3,000	100	40	2,400	50	8.0
NaA---------- Nahunta	IIw	675	2,800	120	45	2,800	55	6.5
NkB---------- Nankin	IIe	600	2,200	75	30	2,200	---	8.0
NoA---------- Noboco	I	700	4,000	115	45	3,000	60	8.0
PaB---------- Pacolet	IIe	525	---	80	---	2,200	---	8.0
PeB2---------- Pacolet	IIIe	425	---	65	25	1,900	35	7.0
RaA---------- Rains	IIIw	450	2,900	110	40	1,900	55	6.5
RmA---------- Riverview	IIw	650	---	130	40	---	55	8.0
RoA---------- Roanoke	IIIw	450	---	105	40	---	45	6.5

See footnote 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	Peanuts	Corn	Soybeans	Tobacco	Wheat	Pasture
		Lbs	Lbs	Bu	Bu	Lbs	Bu	AUM*
SeA---------- Seabrook	IIIs	400	2,200	75	30	2,000	35	6.0
StA---------- State	I	800	3,300	130	45	3,000	60	8.0
StB---------- State	IIe	720	3,000	120	40	2,700	60	8.0
TaA---------- Tarboro	IIIs	350	2,000	50	20	1,700	30	6.0
TbE---------- Tatum	IVe	---	---	---	---	---	---	6.5
TmB2---------- Tatum	IIIe	---	---	65	25	---	30	7.0
TmC2---------- Tatum	IVe	---	---	50	20	---	25	7.0
TtA---------- Tomotley	IIIw	450	---	130	40	---	45	6.5
TuB---------- Turbeville	IIe	625	3,000	120	40	2,800	50	8.0
Ud---------- Udorthents	VIIs	---	---	---	---	---	---	---
WaA---------- Wahee	IIw	---	---	110	45	---	40	6.5
WeB---------- Wedowee	IIe	525	2,500	80	35	2,600	40	8.0
WeC---------- Wedowee	IIIe	400	2,000	65	30	1,800	35	8.0
WeE---------- Wedowee	VIe	---	---	---	---	---	---	6.5
WnF---------- Winton	VIIe	---	---	---	---	---	---	6.0

* 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.

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	Windthrow hazard	Potential productivity: Common trees	Site index	Volume*	Trees to plant
AaA---------- Altavista	9A	Slight	Slight	Slight	Slight	Loblolly pine-------	96	145	Loblolly pine.
						White oak----------	---	---	
						Shortleaf pine------	---	---	
						Sweetgum----------	97	128	
						Red maple----------	---	---	
						Yellow-poplar-------	97	102	
						Southern red oak----	---	---	
						Water oak----------	---	---	
						American beech------	---	---	
						Hickory----------	---	---	
AyA---------- Aycock	8A	Slight	Slight	Slight	Slight	Loblolly pine-------	84	118	Loblolly pine.
						Southern red oak----	---	---	
						White oak----------	---	---	
BaA---------- Bethera	10W	Slight	Severe	Severe	Severe	Loblolly pine-------	92	136	Loblolly pine.
						Sweetgum----------	95	122	
						Blackgum----------	---	---	
						Red maple----------	---	---	
						White oak----------	---	---	
BcA**---------- Bojac	8S	Slight	Slight	Moderate	Slight	Loblolly pine-------	80	110	Loblolly pine.
						Southern red oak----	70	52	
						Sweetgum----------	---	---	
						White oak----------	---	---	
BoB**---------- Bonneau	8S	Slight	Moderate	Moderate	Slight	Loblolly pine-------	80	110	Loblolly pine.
						White oak----------	---	---	
						Hickory----------	---	---	
CbA***:									
Chastain-------	8W	Slight	Severe	Severe	Severe	Sweetgum----------	95	122	Sweetgum,
						Baldcypress---------	---	---	baldcypress.
						Water tupelo--------	---	---	
						Water oak----------	---	---	
Bibb----------	8W	Slight	Severe	Severe	Moderate	Sweetgum----------	90	106	Sweetgum,
						Loblolly pine-------	100	103	yellow-poplar,
						Water oak----------	90	86	eastern
						Blackgum----------	---	---	cottonwood.
						Yellow-poplar-------	---	---	
						Atlantic white-cedar	---	---	
ChA---------- Chewacla	7W	Slight	Moderate	Slight	Moderate	Yellow-poplar-------	96	100	Yellow-poplar,
						Loblolly pine-------	95	142	sweetgum,
						Sweetgum----------	97	128	American
						Water oak----------	90	86	sycamore.
						Eastern cottonwood--	---	---	
						Green ash----------	---	---	
						Southern red oak----	---	---	
						Blackgum----------	---	---	
						Red maple----------	---	---	
						Willow oak----------	---	---	
						American beech------	---	---	
						American sycamore---	---	---	

See footnotes 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	Windthrow hazard	Potential productivity: Common trees	Site index	Volume*	Trees to plant
CwA***:									
Chewacla	7W	Slight	Moderate	Slight	Moderate	Yellow-poplar	96	100	Yellow-poplar, sweetgum, American sycamore.
						Loblolly pine	95	142	
						Sweetgum	97	128	
						Water oak	90	86	
						Eastern cottonwood	---	---	
						Green ash	---	---	
						Southern red oak	---	---	
						Blackgum	---	---	
						Red maple	---	---	
						Willow oak	---	---	
						American beech	---	---	
						American sycamore	---	---	
Wehadkee	8W	Slight	Severe	Moderate	Moderate	Yellow-poplar	100	107	Yellow-poplar, green ash, sweetgum, American sycamore.
						Sweetgum	97	128	
						Loblolly pine	93	138	
						Willow oak	94	91	
						Water oak	99	97	
						Green ash	89	64	
						White ash	---	---	
						American sycamore	---	---	
						River birch	---	---	
DgA Dogue	9A	Slight	Slight	Slight	Slight	Loblolly pine	90	131	Loblolly pine.
						Southern red oak	80	62	
						Sweetgum	90	106	
						Yellow-poplar	93	95	
						White oak	80	62	
DoA, DoB Dothan	9A	Slight	Slight	Moderate	Slight	Loblolly pine	88	127	Loblolly pine.
						Hickory	---	---	
						Water oak	---	---	
EmA, EmB, EmC Emporia	7A	Slight	Slight	Slight	Slight	Loblolly pine	75	101	Loblolly pine, sweetgum.
						Southern red oak	70	52	
EwB***:									
Emporia	7A	Slight	Slight	Slight	Slight	Loblolly pine	75	101	Loblolly pine, sweetgum.
						Southern red oak	70	52	
Wedowee	9A	Slight	Slight	Slight	Slight	Loblolly pine	87	125	Loblolly pine.
						Southern red oak	74	56	
						Northern red oak	---	---	
						White oak	74	56	
ExA Exum	8A	Slight	Slight	Slight	Slight	Loblolly pine	82	114	Loblolly pine.
						Sweetgum	---	---	
						Yellow-poplar	---	---	
						Southern red oak	---	---	
						White oak	---	---	
FuB** Fuquay	8S	Slight	Moderate	Moderate	Slight	Loblolly pine	80	110	Loblolly pine.

See footnotes 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	Windthrow hazard	Potential productivity: Common trees	Site index	Volume*	Trees to plant
GoA---------- Goldsboro	9A	Slight	Slight	Slight	Slight	Loblolly pine-------	88	127	Loblolly pine.
						Sweetgum----------	---	---	
						Southern red oak----	---	---	
						White oak----------	---	---	
						Water oak----------	---	---	
						Yellow-poplar-------	---	---	
						Red maple----------	---	---	
GrA---------- Grantham	9W	Slight	Moderate	Moderate	Moderate	Loblolly pine-------	86	123	Loblolly pine, sweetgum, yellow-poplar.
						Sweetgum----------	---	---	
						Water oak----------	---	---	
						Blackgum----------	---	---	
						Red maple----------	---	---	
						Willow oak----------	---	---	
						Yellow-poplar-------	---	---	
						Pond pine----------	---	---	
GtB, GtC-------- Gritney	8A	Slight	Slight	Slight	Slight	Loblolly pine-------	84	118	Loblolly pine.
						White oak----------	---	---	
						Southern red oak----	---	---	
						Sweetgum----------	---	---	
						Yellow-poplar-------	---	---	
GyB2---------- Gritney	8C	Slight	Moderate	Moderate	Slight	Loblolly pine-------	80	110	Loblolly pine.
						White oak----------	---	---	
						Southern red oak----	---	---	
						Sweetgum----------	---	---	
						Yellow-poplar-------	---	---	
HeA---------- Helena	8A	Slight	Moderate	Slight	Slight	Loblolly pine-------	84	118	Loblolly pine.
						White oak----------	---	---	
						Yellow-poplar-------	---	---	
						Sweetgum----------	---	---	
						Northern red oak----	---	---	
						Southern red oak----	---	---	
						Black oak----------	---	---	
						Hickory----------	---	---	
						Virginia pine-------	---	---	
						Willow oak----------	---	---	
						American elm--------	---	---	
HrB, HrC-------- Herndon	8A	Slight	Moderate	Slight	Slight	Loblolly pine-------	81	112	Loblolly pine.
						White oak----------	68	50	
						Southern red oak----	68	50	
						Yellow-poplar-------	91	92	
LgA---------- Lignum	7W	Slight	Moderate	Slight	Slight	Loblolly pine-------	76	103	Loblolly pine.
						Northern red oak----	---	---	
						Southern red oak----	68	50	
						Red maple----------	---	---	
						Yellow-poplar-------	---	---	
LyA---------- Lynchburg	9W	Slight	Moderate	Slight	Slight	Loblolly pine-------	86	123	Loblolly pine.
						Yellow-poplar-------	92	93	
						Sweetgum----------	90	106	
						Southern red oak----	---	---	
						White oak----------	---	---	
						Blackgum----------	---	---	

See footnotes 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	Windthrow hazard	Potential productivity: Common trees	Site index	Volume*	Trees to plant
MrA, MrB Marlboro	8A	Slight	Slight	Slight	Slight	Loblolly pine	82	114	Loblolly pine.
NaA Nahunta	9W	Slight	Moderate	Slight	Slight	Loblolly pine	87	125	Loblolly pine.
						Sweetgum	---	---	
						Yellow-poplar	---	---	
						Southern red oak	---	---	
						White oak	---	---	
NkB Nankin	8A	Slight	Moderate	Slight	Slight	Loblolly pine	80	110	Loblolly pine.
NoA Noboco	9A	Slight	Slight	Slight	Slight	Loblolly pine	90	131	Loblolly pine.
						Southern red oak	---	---	
						Sweetgum	---	---	
PaB Pacolet	8A	Slight	Moderate	Slight	Slight	Loblolly pine	85	120	Loblolly pine.
						Yellow-poplar	90	90	
						Virginia pine	---	---	
						Northern red oak	---	---	
						Hickory	---	---	
						White oak	---	---	
PeB2 Pacolet	6C	Slight	Moderate	Moderate	Slight	Loblolly pine	70	93	Loblolly pine.
						Yellow-poplar	80	71	
RaA Rains	9W	Slight	Moderate	Moderate	Severe	Loblolly pine	90	131	Loblolly pine, sweetgum.
						Sweetgum	90	106	
RmA Riverview	11A	Slight	Slight	Slight	Slight	Loblolly pine	100	154	Loblolly pine, yellow-poplar, sweetgum, slash pine, eastern cottonwood, American sycamore.
						Yellow-poplar	110	124	
						Sweetgum	100	138	
RoA Roanoke	10W	Slight	Severe	Severe	Severe	Loblolly pine	98	149	Loblolly pine, sweetgum, yellow-poplar.
						Sweetgum	90	106	
						Willow oak	76	68	
SeA Seabrook	8S	Slight	Moderate	Moderate	Slight	Loblolly pine	81	112	Loblolly pine.
						Southern red oak	---	---	
						Sweetgum	---	---	
						Red maple	---	---	
						Yellow-poplar	---	---	
						Water oak	---	---	
						Willow oak	---	---	
						American beech	---	---	
StA, StB State	9A	Slight	Slight	Slight	Slight	Loblolly pine	86	123	Loblolly pine.
						Southern red oak	85	67	
						Yellow-poplar	100	107	
						Hickory	---	---	
						American beech	---	---	
						White oak	---	---	

See footnotes 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	Windthrow hazard	Potential productivity: Common trees	Site index	Volume*	Trees to plant
TaA---------- Tarboro	7S	Slight	Moderate	Moderate	Slight	Loblolly pine-------	72	96	Loblolly pine.
						Southern red oak----	---	---	
						White oak----------	---	---	
						Sweetgum----------	---	---	
						Red maple----------	---	---	
						Water oak----------	---	---	
						Hickory----------	---	---	
TbE---------- Tatum	7R	Moderate	Moderate	Slight	Slight	Loblolly pine-------	75	101	Loblolly pine.
						White oak----------	---	---	
						Chestnut oak--------	---	---	
TmB2, TmC2------ Tatum	7A	Slight	Moderate	Slight	Slight	Loblolly pine-------	75	101	Loblolly pine.
						Northern red oak----	---	---	
						Yellow-poplar-------	---	---	
TtA---------- Tomotley	10W	Slight	Moderate	Moderate	Severe	Loblolly pine-------	97	147	Loblolly pine,
						Water oak----------	---	---	yellow-poplar,
						Willow oak----------	---	---	sweetgum,
						Sweetgum----------	---	---	American
						Yellow-poplar-------	---	---	sycamore.
						Red maple----------	---	---	
						Water tupelo--------	---	---	
						Blackgum----------	---	---	
TuB---------- Turbeville	8A	Slight	Slight	Slight	Slight	Loblolly pine-------	80	110	Loblolly pine.
						Yellow-poplar-------	84	79	
						Southern red oak----	70	52	
WaA---------- Wahee	9W	Slight	Moderate	Moderate	Slight	Loblolly pine-------	86	123	Loblolly pine.
						Sweetgum----------	90	106	
						Blackgum----------	---	---	
						Water oak----------	---	---	
						Swamp chestnut oak--	---	---	
						Willow oak----------	---	---	
						Southern red oak----	---	---	
WeB, WeC-------- Wedowee	9A	Slight	Slight	Slight	Slight	Loblolly pine-------	87	125	Loblolly pine.
						Southern red oak----	74	56	
						Northern red oak----	---	---	
						White oak----------	74	56	
WeE---------- Wedowee	9R	Moderate	Moderate	Slight	Slight	Loblolly pine-------	87	125	Loblolly pine.
						Southern red oak----	74	56	
						Northern red oak----	---	---	
						White oak----------	74	56	
WnF---------- Winton	10R	Severe	Severe	Slight	Slight	Loblolly pine-------	93	138	Loblolly pine.
						Southern red oak----	---	---	
						Sweetgum----------	---	---	
						White oak----------	---	---	
						Water oak----------	---	---	
						American beech------	---	---	

* 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.

** The site index for this map unit is based on the highest database plots in adjacent counties.

*** See description of the map unit for composition and behavior characteristics of the map unit.

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
AaA Altavista	Severe: flooding.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
AyA Aycock	Moderate: percs slowly.	Slight	Moderate: percs slowly.	Slight	Slight.
BaA Bethera	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
BcA Bojac	Slight	Slight	Slight	Slight	Moderate: droughty.
BoB Bonneau	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
CbA*:					
Chastain	Severe: flooding, wetness.	Severe: wetness, too acid.	Severe: wetness, flooding.	Severe: wetness.	Severe: too acid, wetness, flooding.
Bibb	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
ChA Chewacla	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
CwA*:					
Chewacla	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Wehadkee	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
DgA Dogue	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
DoA Dothan	Slight	Slight	Slight	Slight	Moderate: droughty.
DoB Dothan	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
EmA Emporia	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly.	Slight	Slight.
EmB Emporia	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	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
EmC: Emporia	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope.
ErB*:					
Emporia	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight	Slight.
Urban land.					
EwB*:					
Emporia	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, percs slowly.	Slight	Slight.
Wedowee	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
ExA: Exum	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Slight	Slight.
FuB: Fuquay	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
GoA: Goldsboro	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Slight	Slight.
GrA: Grantham	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
GtB: Gritney	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness.	Moderate: wetness.	Moderate: wetness, droughty.
GtC: 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, wetness.	Moderate: wetness.	Moderate: wetness.
HeA: Helena	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
HrB: Herndon	Slight	Slight	Moderate: slope.	Severe: erodes easily.	Slight.
HrC: Herndon	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
LgA: Lignum	Severe: wetness, percs slowly.	Severe: percs slowly.	Severe: wetness, percs slowly.	Moderate: wetness.	Moderate: 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
LyA Lynchburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
MrA Marlboro	Slight	Slight	Slight	Slight	Slight.
MrB Marlboro	Slight	Slight	Moderate: slope.	Slight	Slight.
NaA Nahunta	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
NkB Nankin	Moderate: small stones, percs slowly.	Moderate: small stones, percs slowly.	Severe: small stones.	Slight	Moderate: small stones.
NoA Noboco	Slight	Slight	Slight	Slight	Slight.
PaB Pacolet	Slight	Slight	Moderate: slope.	Slight	Slight.
PeB2 Pacolet	Slight	Slight	Moderate: slope.	Slight	Slight.
RaA Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
RmA Riverview	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.
RoA Roanoke	Severe: flooding, wetness, percs slowly.	Severe: wetness, too acid, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: too acid, wetness.
SeA Seabrook	Severe: flooding.	Moderate: wetness, too sandy.	Moderate: too sandy, wetness.	Moderate: too sandy.	Severe: droughty.
StA State	Slight	Slight	Slight	Slight	Slight.
StB State	Slight	Slight	Moderate: slope.	Slight	Slight.
TaA Tarboro	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy.	Moderate: droughty.
TbE Tatum	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
TmB2 Tatum	Slight	Slight	Moderate: slope.	Slight	Slight.
TmC2 Tatum	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.

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
TtA Tomotley	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
TuB Turbeville	Slight	Slight	Moderate: slope.	Slight	Slight.
Ud. Udorthents					
WaA Wahee	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
WeB Wedowee	Slight	Slight	Moderate: slope.	Slight	Slight.
WeC Wedowee	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
WeE Wedowee	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
WnF 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
AaA---------- Altavista	Good	Good	Good	Good	Good	Poor	Poor	Good	Good.
AyA---------- Aycock	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good.
BaA---------- Bethera	Fair	Fair	Fair	Good	Good	Good	Good	Fair	Good.
BcA---------- Bojac	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good.
BoB---------- Bonneau	Good	Good	Good	Good	Good	Poor	Poor	Good	Good.
CbA*:									
Chastain----------	Very poor.	Poor	Poor	Fair	Poor	Good	Good	Poor	Fair.
Bibb----------	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair.
ChA---------- Chewacla	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good.
CwA*:									
Chewacla----------	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good.
Wehadkee----------	Very poor.	Poor	Poor	Fair	Fair	Good	Fair	Poor	Fair.
DgA---------- Dogue	Good	Good	Good	Good	Good	Poor	Poor	Good	Good.
DoA, DoB---------- Dothan	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good.
EmA, EmB---------- Emporia	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good.
EmC---------- Emporia	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good.
ErB*:									
Emporia----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good.
Urban land.									
EwB*:									
Emporia----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good.
Wedowee----------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	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
ExA---------- Exum	Good	Good	Good	Good	Good	Poor	Poor	Good	Good.
FuB---------- Fuquay	Fair	Fair	Good	Fair	Fair	Poor	Very poor.	Good	Fair.
GoA---------- Goldsboro	Good	Good	Good	Good	Good	Poor	Poor	Good	Good.
GrA---------- Grantham	Good	Good	Good	Good	Good	Poor	Good	Good	Good.
GtB, GtC, GyB2----- Gritney	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good.
HeA---------- Helena	Good	Good	Good	Good	Good	Poor	Poor	Good	Good.
HrB---------- Herndon	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good.
HrC---------- Herndon	Fair	Good	Fair	Good	Good	Very poor.	Very poor.	Fair	Good.
LgA---------- Lignum	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good.
LyA---------- Lynchburg	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good.
MrA, MrB---------- Marlboro	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good.
NaA---------- Nahunta	Good	Good	Good	Good	Good	Poor	Fair	Good	Good.
NkB---------- Nankin	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good.
NoA---------- Noboco	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good.
PaB---------- Pacolet	Fair	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good.
PeB2---------- Pacolet	Poor	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair.
RaA---------- Rains	Fair	Fair	Fair	Good	Good	Good	Good	Fair	Good.
RmA---------- Riverview	Good	Good	Good	Good	Good	Poor	Poor	Good	Good.
RoA---------- Roanoke	Poor	Poor	Fair	Fair	Fair	Good	Good	Fair	Fair.
SeA---------- Seabrook	Fair	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair.

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
StA, StB State	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good.
TaA Tarboro	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor.
TbE Tatum	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good.
TmB2 Tatum	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good.
TmC2 Tatum	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good.
TtA Tomotley	Fair	Fair	Fair	Good	Good	Good	Good	Fair	Good.
TuB Turbeville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good.
Ud. Udorthents									
WaA Wahee	Good	Good	Good	Good	Good	Poor	Poor	Good	Good.
WeB Wedowee	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good.
WeC Wedowee	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good.
WeE Wedowee	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good.
WnF Winton	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good.

* 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
AaA---------- Altavista	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: low strength, wetness, flooding.	Moderate: wetness.
AyA---------- Aycock	Moderate: wetness.	Slight---------	Moderate: wetness.	Slight---------	Moderate: low strength.	Slight.
BaA---------- Bethera	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
BcA---------- Bojac	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Moderate: droughty.
BoB---------- Bonneau	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Moderate: droughty.
CbA*:						
Chastain---------	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: too acid, wetness, flooding.
Bibb----------	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
ChA---------- Chewacla	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness.
CwA*:						
Chewacla---------	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
Wehadkee---------	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
DgA---------- Dogue	Severe: cutbanks cave, wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength.	Moderate: wetness.
DoA---------- Dothan	Moderate: wetness.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Moderate: droughty.
DoB---------- Dothan	Moderate: wetness.	Slight---------	Moderate: wetness.	Moderate: slope.	Slight---------	Moderate: droughty.

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
EmA Emporia	Moderate: too clayey, wetness.	Slight	Moderate: wetness, shrink-swell.	Slight	Moderate: low strength.	Slight.
EmB Emporia	Moderate: too clayey, wetness.	Slight	Moderate: wetness, shrink-swell.	Moderate: slope.	Moderate: low strength.	Slight.
EmC Emporia	Moderate: too clayey, wetness, slope.	Moderate: slope.	Moderate: wetness, slope, shrink-swell.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
ErB*:						
Emporia	Moderate: too clayey, wetness.	Slight	Moderate: wetness, shrink-swell.	Slight	Moderate: low strength.	Slight.
Urban land.						
EwB*:						
Emporia	Moderate: too clayey, wetness.	Slight	Moderate: wetness, shrink-swell.	Moderate: slope.	Moderate: low strength.	Slight.
Wedowee	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.
ExA Exum	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: low strength, wetness.	Slight.
FuB Fuquay	Slight	Slight	Moderate: wetness.	Slight	Slight	Severe: droughty.
GoA Goldsboro	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Slight.
GrA Grantham	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
GtB Gritney	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: low strength.	Moderate: wetness, droughty.
GtC 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.
HeA Helena	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Moderate: wetness.

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
HrB Herndon	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.
HrC Herndon	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
LgA Lignum	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
LyA Lynchburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
MrA Marlboro	Moderate: too clayey, wetness.	Slight	Moderate: wetness.	Slight	Slight	Slight.
MrB Marlboro	Moderate: too clayey, wetness.	Slight	Moderate: wetness.	Moderate: slope.	Slight	Slight.
NaA Nahunta	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
NkB Nankin	Moderate: too clayey, dense layer.	Slight	Slight	Slight	Slight	Moderate: small stones.
NoA Noboco	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Slight	Slight.
PaB, PeB2 Pacolet	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.
RaA Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
RmA Riverview	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
RoA Roanoke	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: too acid, wetness.
SeA Seabrook	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Severe: droughty.
StA State	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Moderate: low strength.	Slight.
StB State	Severe: cutbanks cave.	Slight	Moderate: wetness.	Moderate: slope.	Moderate: low strength.	Slight.
TaA Tarboro	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
TbE Tatum	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.

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
TmB2 Tatum	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
TmC2 Tatum	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
TtA Tomotley	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.
TuB Turbeville	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
Ud. Udorthents						
WaA Wahee	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness.	Severe: wetness.
WeB Wedowee	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.
WeC Wedowee	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
WeE Wedowee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
WnF 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
AaA Altavista	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
AyA Aycock	Severe: wetness, percs slowly.	Moderate: seepage, wetness.	Slight	Slight	Good.
BaA Bethera	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
BcA Bojac	Moderate: wetness.	Severe: seepage.	Severe: wetness, seepage.	Severe: seepage.	Fair: thin layer.
BoB Bonneau	Severe: wetness.	Severe: seepage.	Severe: wetness.	Severe: seepage.	Good.
CbA*:					
Chastain	Severe: flooding, wetness, percs slowly.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
Bibb	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: wetness.
ChA Chewacla	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: hard to pack, wetness.
CwA*:					
Chewacla	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: hard to pack, wetness.
Wehadkee	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness, thin layer.
DgA Dogue	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: seepage, wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
DoA Dothan	Severe: wetness, percs slowly.	Moderate: seepage.	Moderate: wetness.	Slight	Good.

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
DoB---------- Dothan	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Moderate: wetness.	Slight----------	Good.
EmA, EmB---------- Emporia	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Moderate: wetness, too clayey.	Slight----------	Fair: too clayey, wetness.
EmC---------- Emporia	Severe: wetness, percs slowly.	Severe: seepage, slope, wetness.	Moderate: wetness, slope, too clayey.	Moderate: slope.	Fair: slope, too clayey, wetness.
ErB*:					
Emporia----------	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Moderate: wetness, too clayey.	Slight----------	Fair: too clayey, wetness.
Urban land.					
EwB*:					
Emporia----------	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Moderate: wetness, too clayey.	Slight----------	Fair: too clayey, wetness.
Wedowee----------	Moderate: percs slowly.	Moderate: seepage, slope.	Slight----------	Slight----------	Fair: small stones.
ExA---------- Exum	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
FuB---------- Fuquay	Severe: percs slowly.	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
GoA---------- Goldsboro	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
GrA---------- Grantham	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
GtB---------- Gritney	Severe: wetness, percs slowly.	Moderate: slope.	Severe: seepage, wetness, too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
GtC---------- 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.

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
HeA Helena	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
HrB Herndon	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, hard to pack.
HrC Herndon	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.
LgA Lignum	Severe: percs slowly, wetness.	Moderate: depth to rock.	Severe: depth to rock, wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
LyA Lynchburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
MrA Marlboro	Moderate: wetness, percs slowly.	Moderate: seepage, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
MrB Marlboro	Moderate: wetness, percs slowly.	Moderate: seepage, slope, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
NaA Nahunta	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
NkB Nankin	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
NoA Noboco	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
PaB, PeB2 Pacolet	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Fair: too clayey.
RaA Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
RmA Riverview	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Fair: thin layer.
RoA Roanoke	Severe: flooding, wetness, percs slowly.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.

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
SeA---------- Seabrook	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
StA, StB---------- State	Moderate: wetness, percs slowly.	Severe: seepage.	Severe: seepage, wetness.	Moderate: wetness.	Fair: too clayey, thin layer.
TaA---------- Tarboro	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: seepage.
TbE---------- Tatum	Severe: slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
TmB2---------- Tatum	Moderate: depth to rock, percs slowly.	Moderate: seepage, depth to rock, slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock.	Poor: too clayey, hard to pack.
TmC2---------- Tatum	Moderate: depth to rock, percs slowly, slope.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.
TtA---------- Tomotley	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
TuB---------- Turbeville	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight----------	Poor: too clayey, hard to pack, small stones.
Ud. Udorthents					
WaA---------- Wahee	Severe: wetness, percs slowly.	Slight----------	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
WeB---------- Wedowee	Moderate: percs slowly.	Moderate: seepage, slope.	Slight----------	Slight----------	Fair: small stones.
WeC---------- Wedowee	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: small stones, slope.
WeE---------- Wedowee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
WnF---------- 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
AaA Altavista	Fair: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
AyA Aycock	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
BaA Bethera	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
BcA Bojac	Good	Probable	Improbable: too sandy.	Fair: too sandy.
BoB Bonneau	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy.
CbA*:				
Chastain	Poor: wetness.	Probable	Improbable: excess fines.	Poor: too clayey, wetness, too acid.
Bibb	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness.
ChA Chewacla	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
CwA*:				
Chewacla	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Wehadkee	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
DgA Dogue	Fair: wetness.	Probable	Improbable: too sandy.	Fair: too clayey.
DoA, DoB Dothan	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
EmA, EmB Emporia	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
EmC Emporia	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.

See footnote at end of table.

Table 11.—Construction Materials—Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
ErB*:				
Emporia	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
Urban land.				
EwB*:				
Emporia	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Wedowee	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
ExA Exum	Fair: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
FuB Fuquay	Good	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy.
GoA Goldsboro	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
GrA Grantham	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
GtB, GtC, GyB2 Gritney	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
HeA Helena	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
HrB, HrC Herndon	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
LgA Lignum	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, area reclaim.
LyA Lynchburg	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
MrA, MrB Marlboro	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
NaA Nahunta	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
NkB Nankin	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
NoA Noboco	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
PaB, PeB2 Pacolet	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.

See footnote at end of table.

Table 11.—Construction Materials—Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
RaA Rains	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
RmA Riverview	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, thin layer.
RoA Roanoke	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness, too acid.
SeA Seabrook	Fair: wetness.	Probable	Improbable: too sandy.	Fair: too sandy.
StA, StB State	Good	Probable	Improbable: too sandy.	Fair: too clayey.
TaA Tarboro	Good	Probable	Improbable: too sandy.	Fair: too sandy.
TbE, TmB2, TmC2 Tatum	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, area reclaim.
TtA Tomotley	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
TuB Turbeville	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, area reclaim.
Ud. Udorthents				
WaA Wahee	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
WeB, WeC Wedowee	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
WeE Wedowee	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
WnF 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	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
AaA Altavista	Moderate: seepage.	Severe: piping, wetness.	Favorable	Wetness	Wetness, soil blowing.	Favorable.
AyA Aycock	Moderate: seepage.	Moderate: piping.	Deep to water	Soil blowing, erodes easily.	Erodes easily, soil blowing.	Erodes easily.
BaA Bethera	Slight	Severe: ponding, hard to pack.	Ponding, percs slowly.	Ponding, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
BcA Bojac	Severe: seepage.	Severe: piping.	Deep to water	Droughty, fast intake.	Soil blowing	Droughty.
BoB Bonneau	Severe: seepage.	Severe: thin layer.	Deep to water	Droughty, fast intake.	Soil blowing	Droughty.
CbA*:						
Chastain	Severe: seepage.	Severe: hard to pack, wetness.	Percs slowly, flooding, too acid.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Bibb	Severe: seepage.	Severe: seepage, wetness, piping.	Flooding	Wetness, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
ChA Chewacla	Moderate: seepage.	Severe: piping, hard to pack, wetness.	Flooding	Wetness, flooding.	Wetness	Wetness.
CwA*:						
Chewacla	Moderate: seepage.	Severe: piping, hard to pack, wetness.	Flooding	Wetness, flooding.	Wetness	Wetness.
Wehadkee	Moderate: seepage.	Severe: piping, wetness.	Flooding	Wetness, soil blowing, flooding.	Wetness, soil blowing.	Wetness.
DgA Dogue	Moderate: seepage.	Severe: wetness.	Favorable	Wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
DoA Dothan	Moderate: seepage.	Moderate: piping.	Deep to water	Fast intake, droughty.	Favorable	Droughty.
DoB Dothan	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Fast intake, slope, droughty.	Favorable	Droughty.

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	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
EmA: Emporia	Moderate: seepage.	Moderate: thin layer, piping.	Deep to water	Soil blowing	Soil blowing, percs slowly.	Percs slowly.
EmB: Emporia	Moderate: seepage, slope.	Moderate: thin layer, piping.	Deep to water	Soil blowing, slope.	Soil blowing, percs slowly.	Percs slowly.
EmC: Emporia	Severe: slope.	Moderate: thin layer, piping.	Deep to water	Soil blowing, slope.	Slope, soil blowing, percs slowly.	Slope, percs slowly.
ErB*:						
Emporia	Moderate: seepage, slope.	Moderate: thin layer, piping.	Deep to water	Soil blowing, slope.	Soil blowing, percs slowly.	Percs slowly.
Urban land.						
EwB*:						
Emporia	Moderate: seepage, slope.	Moderate: thin layer, piping.	Deep to water	Soil blowing, slope.	Soil blowing, percs slowly.	Percs slowly.
Wedowee	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope	Favorable	Favorable.
ExA: Exum	Slight	Moderate: piping, wetness.	Favorable	Wetness, erodes easily, soil blowing.	Erodes easily, wetness, soil blowing.	Erodes easily.
FuB: Fuquay	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
GoA: Goldsboro	Moderate: seepage.	Moderate: piping, wetness.	Favorable	Wetness, soil blowing.	Wetness, soil blowing.	Favorable.
GrA: Grantham	Slight	Severe: wetness.	Favorable	Wetness, soil blowing, erodes easily.	Erodes easily, wetness, soil blowing.	Wetness, erodes easily.
GtB: Gritney	Moderate: slope.	Moderate: hard to pack, wetness.	Percs slowly, slope.	Slope, wetness, droughty.	Wetness, percs slowly.	Percs slowly.
GtC: Gritney	Severe: slope.	Moderate: hard to pack, wetness.	Percs slowly, slope.	Slope, wetness, droughty.	Slope, wetness, percs slowly.	Slope, percs slowly.
GyB2: Gritney	Moderate: slope.	Moderate: hard to pack, wetness.	Percs slowly, slope.	Slope, wetness.	Wetness, percs slowly.	Erodes easily, percs slowly.
HeA: Helena	Slight	Severe: hard to pack.	Percs slowly	Wetness, percs slowly.	Wetness, percs slowly.	Percs slowly.

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	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
HrB Herndon	Moderate: seepage, slope.	Severe: hard to pack.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
HrC Herndon	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
LgA Lignum	Moderate: depth to rock.	Moderate: thin layer, hard to pack, wetness.	Percs slowly	Wetness, percs slowly.	Erodes easily, wetness.	Wetness, erodes easily.
LyA Lynchburg	Moderate: seepage.	Severe: piping, wetness.	Favorable	Wetness, soil blowing.	Wetness, soil blowing.	Wetness.
MrA Marlboro	Moderate: seepage.	Severe: piping.	Deep to water	Soil blowing	Soil blowing	Favorable.
MrB Marlboro	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope, soil blowing.	Soil blowing	Favorable.
NaA Nahunta	Slight	Severe: wetness.	Favorable	Wetness, erodes easily, soil blowing.	Erodes easily, wetness, soil blowing.	Wetness, erodes easily.
NkB Nankin	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Fast intake, slope, soil blowing.	Soil blowing	Favorable.
NoA Noboco	Moderate: seepage.	Severe: piping.	Favorable	Wetness	Wetness	Rooting depth.
PaB Pacolet	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope	Soil blowing	Favorable.
PeB2 Pacolet	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope	Favorable	Favorable.
RaA Rains	Moderate: seepage.	Severe: piping, wetness.	Favorable	Wetness	Wetness, soil blowing.	Wetness.
RmA Riverview	Severe: seepage.	Severe: piping.	Deep to water	Flooding	Favorable	Favorable.
RoA Roanoke	Severe: seepage.	Severe: wetness.	Percs slowly, flooding, too acid.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
SeA Seabrook	Severe: seepage.	Severe: seepage, piping.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.

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	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
StA---------- State	Severe: seepage.	Moderate: thin layer, piping.	Deep to water	Soil blowing---	Soil blowing---	Favorable.
StB---------- State	Severe: seepage.	Moderate: thin layer, piping.	Deep to water	Slope, soil blowing.	Soil blowing---	Favorable.
TaA---------- Tarboro	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty, rooting depth.
TbE---------- Tatum	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
TmB2---------- Tatum	Moderate: seepage, depth to rock, slope.	Severe: hard to pack.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
TmC2---------- Tatum	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
TtA---------- Tomotley	Moderate: seepage.	Severe: piping, wetness.	Favorable------	Wetness, soil blowing.	Wetness, soil blowing.	Wetness.
TuB---------- Turbeville	Moderate: seepage, slope.	Moderate: hard to pack.	Deep to water	Slope----------	Favorable------	Favorable.
Ud. Udorthents						
WaA---------- Wahee	Slight---------	Severe: hard to pack, wetness.	Percs slowly---	Wetness--------	Wetness, percs slowly.	Wetness, percs slowly.
WeB---------- Wedowee	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope----------	Favorable------	Favorable.
WeC, WeE---------- Wedowee	Severe: slope.	Severe: piping.	Deep to water	Slope----------	Slope----------	Slope.
WnF---------- Winton	Severe: slope.	Moderate: piping, wetness.	Slope----------	Slope, wetness.	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 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
AaA---------- Altavista	0-12	Fine sandy loam	ML, CL-ML, SM, SC-SM	A-4	0	95-100	90-100	65-99	35-60	<23	NP-7
	12-36	Clay loam, sandy clay loam, 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
	36-62	Variable---------	---	---	---	---	---	---	---	---	---
AyA---------- Aycock	0-10	Silt loam--------	ML, CL-ML, CL	A-4	0	100	95-100	80-100	51-80	<25	NP-10
	10-74	Clay loam, silty clay loam, loam.	CL	A-4, A-6, A-7	0	100	95-100	90-100	60-90	22-49	8-30
BaA---------- Bethera	0-13	Loam----------	CL	A-4, A-6	0	100	95-100	85-95	60-75	30-37	8-14
	13-63	Clay, clay loam, sandy clay, silty clay.	CL, CH, ML, MH	A-6, A-7	0	100	98-100	93-100	55-95	37-55	12-30
BcA---------- Bojac	0-18	Loamy fine sand	SM	A-2	0	95-100	95-100	50-100	15-30	<20	NP
	18-53	Fine sandy loam, loam, sandy loam, sandy clay loam.	ML, SM	A-2, A-4	0	95-100	95-100	55-100	20-60	<35	NP-10
	53-74	Stratified loamy fine sand to coarse sand.	SM, SP, SW-SM	A-1, A-2, A-3	0	90-100	75-100	12-100	2-35	<20	NP
BoB---------- Bonneau	0-23	Loamy fine sand	SM	A-2	0	100	100	50-95	15-35	---	NP
	23-36	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
	36-66	Sandy loam, sandy clay loam, sandy clay, fine sandy loam.	CL, SC, SC-SM, CL-ML	A-4, A-6, A-2	0	100	100	60-95	25-60	20-40	4-18
CbA*:											
Chastain--------	0-5	Clay loam--------	ML, CL, MH, CH	A-6, A-7	0	100	100	90-100	75-98	35-75	12-40
	5-72	Silty clay loam, clay loam, clay, silty clay, sandy clay loam.	CL, CH, ML, MH	A-6, A-7	0	100	100	95-100	85-98	35-75	12-40
Bibb----------	0-10	Loam----------	ML, CL-ML	A-4	0	95-100	90-100	80-90	50-80	<25	NP-7
	10-36	Sandy loam, loam, fine sandy loam.	SM, SC-SM, ML, CL-ML	A-2, A-4	0	95-100	50-100	40-100	30-90	<30	NP-7
	36-66	Sand, loamy sand, coarse sand, loamy fine sand, fine sandy loam, sandy loam.	SM, SP-SM	A-2, A-3, A-1-b	0	95-100	90-100	40-90	8-35	---	NP

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 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
ChA---------- Chewacla	0-4	Loam----------	ML, CL, CL-ML	A-4, A-6, A-7	0	98-100	95-100	70-100	55-90	25-49	4-20
	4-60	Silt loam, silty clay loam, clay loam, sandy loam, loam, sandy clay loam.	ML, MH, CL, CH, SM, SC-SM	A-4, A-6, A-7	0	90-100	95-100	60-100	36-98	20-61	4-28
CwA*:											
Chewacla--------	0-4	Loam----------	ML, CL, CL-ML	A-4, A-6, A-7	0	98-100	95-100	70-100	55-90	25-49	4-20
	4-60	Silt loam, silty clay loam, clay loam, sandy loam, loam, sandy clay loam.	ML, MH, CL, CH, SM, SC-SM	A-4, A-6, A-7	0	90-100	95-100	60-100	36-98	20-61	4-28
Wehadkee--------	0-7	Loam----------	SM, SC, SC-SM	A-2, A-4	0	100	95-100	60-90	30-50	<30	NP-10
	7-33	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
	33-60	Variable---------	---	---	---	---	---	---	---	---	---
DgA---------- Dogue	0-8	Silt loam--------	ML, CL, SM, SC	A-4	0	95-100	90-100	60-100	40-85	<30	NP-10
	8-13	Clay loam, sandy clay loam, loam.	SM-SC, CL-ML	A-4, A-6, A-7	0	90-100	95-100	80-100	33-80	25-35	13-18
	13-40	Sandy clay loam, sandy clay, clay loam, clay.	SC, CL, CH, CL-ML	A-2, A-4, A-6, A-7	0	90-100	90-100	45-95	30-80	25-55	8-30
	40-53	Sandy loam, sandy clay loam, clay loam, sandy clay.	CL, SC, SC-SM	A-2, A-4, A-6	0	90-100	95-100	60-95	25-60	20-40	NP-18
	53-62	Stratified sand to sandy clay loam.	SM, SC, SP-SM, SC-SM	A-2, A-4, A-1	0	95-100	90-100	35-100	10-40	<30	NP-10
DoA, DoB--------- Dothan	0-17	Loamy sand-------	SM	A-2	0	95-100	92-100	60-80	13-30	---	NP
	17-37	Sandy clay loam, sandy loam, fine sandy loam.	SC-SM, SC, SM	A-2, A-4, A-6	0	95-100	92-100	60-90	23-49	<40	NP-16
	37-61	Sandy clay loam, sandy clay, clay.	SC, CL, CH, CL-ML	A-2, A-4, A-6, A-7	0	90-100	90-100	45-95	30-80	22-55	8-30
	61-72	Sandy loam, sandy clay loam, sandy clay.	CL, SC, SC-SM	A-2, A-4, A-6	0	95-100	95-100	60-95	25-60	20-40	4-18

See footnote at end of table.

Table 13.—Engineering Index Properties—Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
EmA, EmB, EmC---- Emporia	0-10	Fine sandy loam	CL, SC, SM, ML	A-2, A-4, A-6	0	90-100	90-100	50-95	25-65	<25	NP-15
	10-17	Fine sandy loam, sandy loam, loam.	SM, ML, SC, SC-SM	A-2, A-4, A-6	0	95-100	95-100	55-100	20-60	<35	NP-10
	17-43	Sandy clay loam, sandy loam, clay loam.	SC, CL	A-2, A-4, A-6, A-7	0	90-100	90-100	45-95	25-70	20-50	8-30
	43-58	Sandy clay loam, clay loam, sandy clay, clay.	SC, CL, CH	A-2, A-4, A-6, A-7	0	90-100	90-100	45-95	30-80	25-55	8-30
	58-67	Stratified sandy loam to clay.	SM, SC, ML, CL	A-1, A-2, A-4, A-6	0	90-100	90-100	30-90	20-60	<40	NP-25
ErB*:											
Emporia---------	0-10	Fine sandy loam	CL, SC, SM, ML	A-2, A-4, A-6	0	90-100	90-100	50-95	25-65	<25	NP-15
	10-17	Fine sandy loam, sandy loam, loam.	SM, ML, SC, SC-SM	A-2, A-4, A-6	0	95-100	95-100	55-100	20-60	<35	NP-10
	17-43	Sandy clay loam, sandy loam, clay loam.	SC, CL	A-2, A-4, A-6, A-7	0	90-100	90-100	45-95	25-70	20-50	8-30
	43-58	Sandy clay loam, clay loam, sandy clay, clay.	SC, CL, CH	A-2, A-4, A-6, A-7	0	90-100	90-100	45-95	30-80	25-55	8-30
	58-67	Stratified sandy loam to clay.	SM, SC, ML, CL	A-1, A-2, A-4, A-6	0	90-100	90-100	30-90	20-60	<40	NP-25
Urban land.											
EwB*:											
Emporia---------	0-10	Fine sandy loam	CL, SC, SM, ML	A-2, A-4, A-6	0-3	90-100	80-100	50-95	25-65	<25	NP-15
	10-17	Fine sandy loam, sandy loam, loam.	SM, ML, SC, SC-SM	A-2, A-4, A-6	0	95-100	95-100	55-100	20-60	<35	NP-10
	17-43	Sandy clay loam, sandy loam, clay loam.	SC, CL	A-2, A-4, A-6, A-7	0-2	90-100	80-100	45-95	25-70	20-50	8-30
	43-58	Sandy clay loam, clay loam, sandy clay, clay.	SC, CL, CH	A-2, A-4, A-6, A-7	0-2	90-100	80-100	45-95	30-80	25-55	8-30
	58-67	Stratified sandy loam to clay.	SM, SC, ML, CL	A-1, A-2, A-4, A-6	0	70-100	55-100	30-90	20-60	<40	NP-25
Wedowee---------	0-10	Sandy loam-------	SM, SC-SM	A-4, A-2-4	0	95-100	95-100	50-99	23-50	<30	NP-6
	10-36	Sandy clay, clay loam, clay, sandy clay loam, loam.	SC, ML, CL, MH	A-6, A-7	0	95-100	95-100	65-97	45-75	28-58	5-30
	36-63	Sandy clay loam, clay loam, sandy loam, fine sandy loam, loam, sandy clay.	SC, SC-SM, CL, CL-ML	A-2, A-4, A-6	0	95-100	95-100	60-80	30-60	20-54	NP-30

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 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct					Pct	
ExA---------- Exum	0-15	Silt loam--------	ML, CL-ML, CL	A-4	0	100	95-100	80-100	51-80	<25	NP-10
	15-62	Loam, clay loam, silty clay loam, silt loam.	CL	A-4, A-6, A-7	0	100	95-100	90-100	60-90	22-49	8-30
FuB---------- Fuquay	0-25	Sand----------	SP-SM, SM	A-1, A-2, A-3	0	95-100	90-100	45-80	5-20	---	NP
	25-42	Sandy loam, fine sandy loam, sandy clay loam.	SM, SC, SC-SM	A-2, A-4, A-6	0	95-100	90-100	70-90	23-45	<45	NP-13
	42-62	Sandy loam, fine sandy loam, sandy clay loam.	SC, SC-SM	A-2, A-4, A-6	0	95-100	95-100	60-100	30-50	21-40	NP-18
	62-70	Sandy loam, sandy clay loam, clay loam.	SC, SC-SM, CL	A-2, A-4, A-6, A-7	0	90-100	90-100	45-95	25-70	20-50	NP-30
GoA---------- Goldsboro	0-7	Fine sandy loam	SM, SC-SM, SC	A-2, A-4, A-6	0	95-100	95-100	50-100	15-45	<25	NP-14
	7-35	Sandy clay loam, sandy loam, loam, clay 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
	35-72	Sandy clay loam, clay loam, sandy clay, 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
GrA---------- Grantham	0-12	Loam----------	ML, CL-ML	A-4	0	100	100	85-100	55-85	<30	NP-7
	12-75	Loam, clay loam, silty clay loam.	CL	A-4, A-6, A-7	0	100	100	90-100	60-95	22-49	8-30
GtB, GtC--------- Gritney	0-6	Fine sandy loam	SM, SC, SC-SM, ML	A-2, A-4	0	90-100	90-100	60-95	30-90	<30	NP-8
	6-57	Clay, sandy clay, clay loam, sandy clay loam.	CH, CL, SC	A-7	0	95-100	90-100	80-100	45-80	45-70	22-40
	57-60	Stratified loamy sand to sandy clay loam, sandy clay, clay.	SM, SC, ML, CL	A-1, A-2, A-4, A-6	0	90-100	90-100	30-90	20-60	<40	NP-25
GyB2---------- Gritney	0-4	Sandy clay loam	SC, CL	A-4, A-6	0	90-100	90-100	80-100	36-60	20-40	8-22
	4-38	Clay, sandy clay, clay loam, sandy clay loam.	CH, CL, SC	A-7	0	95-100	90-100	80-100	45-80	45-70	22-40
	38-60	Stratified loamy sand to sandy clay loam, sandy clay, clay.	SM, SC, ML, CL	A-1, A-2, A-4, A-6	0	90-100	90-100	30-90	20-60	<40	NP-25
HeA---------- Helena	0-8	Sandy loam-------	SM, SC-SM, SC, ML	A-2, A-4	0	90-100	90-100	51-95	26-75	<35	NP-10
	8-48	Clay loam, sandy clay, clay, sandy clay loam, loam.	CH	A-7	0	95-100	95-100	73-97	56-86	50-85	8-50
	48-62	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 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
HrB, HrC--------- Herndon	0-8	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	90-100	90-100	80-98	60-90	<36	NP-12
	8-39	Silty clay loam, silty clay, clay.	MH, CH	A-7	0	90-100	90-100	60-95	55-95	50-80	20-45
	39-45	Loam, silt loam, silty clay loam, clay loam.	MH, CL, ML-CL	A-4, A-6, A-7	0	95-100	95-100	80-100	50-90	22-49	NP-30
	45-61	Silt loam, loam, fine sandy loam.	MH, ML	A-7, A-5	0	90-100	90-100	80-99	51-95	41-70	9-36
LgA---------- Lignum	0-13	Silt loam--------	CL, CL-ML	A-4, A-6	0	95-100	90-100	80-100	55-90	20-35	5-19
	13-46	Silty clay loam, silty clay, clay, clay loam.	CH, CL	A-7	0	95-100	90-100	70-100	55-90	45-70	22-45
	46-58	Sandy clay loam, silt loam, silty clay loam.	SC, CL, ML, SM	A-4, A-6, A-7, A-2	0	95-100	90-100	30-80	20-75	30-50	8-18
	58-63	Weathered bedrock	---	---	---	---	---	---	---	---	---
LyA---------- Lynchburg	0-8	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
	8-68	Sandy clay loam, sandy loam, clay loam, fine sandy loam, loam.	SC-SM, SC, CL, CL-ML	A-2, A-4, A-6	0	92-100	90-100	70-100	25-67	15-40	NP-18
MrA, MrB--------- Marlboro	0-7	Fine sandy loam	SM, ML	A-2, A-4	0	98-100	95-100	75-100	30-60	<35	NP-7
	7-66	Sandy clay, clay loam, clay.	CL, ML, CL-ML	A-4, A-6, A-7	0	98-100	95-100	78-100	51-70	25-48	6-20
	66-74	Sandy clay, clay, clay loam.	CL, ML, CL-ML	A-4, A-6, A-7	0	98-100	95-100	74-100	45-70	24-48	6-20
NaA---------- Nahunta	0-8	Silt loam--------	ML, CL-ML, CL	A-4	0	100	95-100	80-100	51-85	<25	NP-10
	8-75	Loam, clay loam, silty clay loam, silt loam.	CL	A-4, A-6, A-7	0	100	95-100	90-100	60-95	22-49	8-30
NkB---------- Nankin	0-9	Gravelly loamy sand.	SM, SP-SM	A-2-4	0	65-80	60-75	50-70	10-35	15-20	NP
	9-52	Sandy clay, clay loam, clay.	SC, CL, ML, CL-ML	A-4, A-6, A-7	0	98-100	95-100	75-95	40-70	25-45	7-20
	52-64	Sandy clay loam, sandy loam.	SC, SC-SM, CL, CL-ML	A-2, A-4, A-6	0	98-100	95-100	70-85	25-55	20-40	4-16
NoA---------- Noboco	0-10	Fine sandy loam	SM, SC-SM, SC	A-2	0	95-100	95-100	50-91	15-33	<25	NP-14
	10-18	Fine sandy loam, sandy loam.	SM, SC, SC-SM	A-2, A-4, A-6	0	90-100	90-100	70-90	23-45	<45	NP-13
	18-54	Sandy loam, sandy clay loam, clay loam, fine sandy loam.	SC-SM, SC, CL, CL-ML	A-2, A-4, A-6	0	95-100	95-100	70-96	30-63	20-38	NP-15
	54-64	Sandy clay loam, clay loam, sandy clay, sandy loam, fine sandy loam.	SC-SM, SC, CL, CL-ML	A-4, A-6, A-7-6	0	98-100	98-100	70-98	36-72	20-52	NP-23

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 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
PaB---------- Pacolet	0-8	Sandy loam-------	SM, SC-SM	A-2, A-1-b, A-4	0	90-100	90-100	42-90	16-42	<28	NP-7
	8-27	Sandy clay, clay loam, clay.	ML, MH, CL	A-6, A-7	0	90-100	90-100	60-100	51-75	38-65	11-33
	27-35	Clay loam, sandy clay loam, sandy loam, loam.	CL, CL-ML, SC-SM, SC	A-2, A-4, A-6	0	90-100	90-100	60-80	30-60	20-35	5-15
	35-63	Sandy loam, loam, sandy clay loam.	SM, SC-SM	A-4, A-2-4	0	90-100	90-100	60-90	25-50	<28	NP-20
PeB2---------- Pacolet	0-2	Sandy clay loam	SC-SM, SC	A-4, A-6	0	95-100	90-100	65-87	36-50	20-40	4-17
	2-21	Sandy clay, clay loam, clay.	ML, MH, CL	A-6, A-7	0	95-100	90-100	60-100	51-75	38-65	11-33
	21-28	Clay loam, sandy clay loam, sandy loam, loam.	CL, CL-ML, SC-SM, SC	A-2, A-4, A-6	0	95-100	90-100	60-80	30-60	20-35	5-15
	28-64	Sandy loam, fine sandy loam, loam, sandy clay loam.	SM, SC-SM	A-4, A-2-4	0	95-100	90-100	60-90	25-50	<28	NP-20
RaA---------- Rains	0-7	Fine sandy loam	SM, ML	A-2, A-4	0	100	95-100	50-85	25-56	<35	NP-10
	7-28	Fine sandy loam, sandy clay loam, sandy 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
	28-72	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
RmA---------- Riverview	0-6	Loam----------	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	60-80	15-30	3-14
	6-63	Sandy clay loam, silty clay loam, loam, fine sandy loam.	CL, ML, CL-ML, SM	A-4, A-6, A-2	0	100	100	90-100	60-95	20-40	NP-20
RoA---------- Roanoke	0-8	Loam----------	SC-SM, CL-ML, CL, SC	A-4, A-6	0	95-100	90-100	60-100	35-90	20-35	5-16
	8-52	Clay, silty clay, clay loam, silty clay loam.	CH, CL	A-7	0	90-100	90-100	85-100	65-95	45-70	22-40
	52-70	Sandy clay loam, silty clay loam, clay loam, clay.	CL-ML, CH	A-1, A-2, A-4	0	90-100	90-100	25-95	15-90	35-75	12-40
SeA---------- Seabrook	0-9	Loamy sand-------	SM, SP-SM	A-2, A-3	0	95-100	90-100	85-99	5-25	---	NP
	9-63	Loamy fine sand, fine sand, sand, coarse sand, loamy coarse sand, loamy sand.	SM, SP-SM	A-2, A-3	0	95-100	90-100	85-100	5-25	---	NP

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 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
StA, StB--------- State	0-6	Fine sandy loam	SM, ML, CL-ML, SC-SM	A-2, A-4	0	95-100	95-100	45-85	25-55	<28	NP-7
	6-44	Loam, clay loam, sandy clay loam.	CL, SC	A-4, A-6	0	95-100	95-100	75-100	35-80	24-40	NP-22
	44-75	Stratified sand to fine sandy loam.	SM, SC-SM, SP-SM	A-1, A-2, A-3, A-4	0	95-100	95-100	40-90	5-50	<25	NP-7
TaA---------- Tarboro	0-9	Loamy sand-------	SM, SP-SM, SW-SM	A-2, A-3, A-1	0	95-100	95-100	40-99	8-35	---	NP
	9-82	Sand, coarse sand, loamy sand, loamy coarse sand, loamy fine sand.	SP, SP-SM, SW-SM, SM	A-2, A-3, A-1	0	95-100	90-100	45-100	3-15	---	NP
TbE---------- Tatum	0-5	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	90-100	90-100	65-100	60-90	20-34	5-15
	5-54	Silty clay loam, silty clay, clay, clay loam.	MH, CH, CL	A-7	0	90-100	90-95	60-95	55-95	50-80	20-45
	54-63	Weathered bedrock	---	---	---	---	---	---	---	---	---
TmB2, TmC2------- Tatum	0-6	Silty clay loam	CL	A-6, A-7	0	90-100	90-100	65-90	60-85	32-44	12-20
	6-50	Silty clay loam, silty clay, clay, clay loam.	MH, CH, CL	A-7	0	90-100	90-95	60-95	55-95	50-80	20-45
	50-62	Weathered bedrock	---	---	---	---	---	---	---	---	---
TtA---------- Tomotley	0-5	Fine sandy loam	SM, SC-SM	A-2, A-4	0	98-100	95-100	75-99	25-50	<30	NP-7
	5-9	Sandy loam, fine sandy loam, loam, silt loam.	ML, SM, SC-SM	A-2, A-4	0	95-100	95-100	55-100	20-60	<35	NP-10
	9-31	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
	31-45	Fine sandy loam, sandy clay loam, sandy clay.	SC-SM, SC, CL-ML, CL	A-4, A-6, A-7	0	98-100	95-100	75-99	36-75	20-45	6-22
	45-60	Variable---------	---	---	---	---	---	---	---	---	---
TuB---------- Turbeville	0-9	Fine sandy loam	SM, ML, CL-ML, SC-SM	A-2, A-4	0	90-100	90-100	50-85	25-55	<25	NP-5
	9-12	Loam, clay loam, fine sandy loam, sandy clay loam.	CL, SC, SM, SC-SM	A-4, A-6, A-7	0	90-100	90-100	50-100	35-75	30-45	NP-20
	12-86	Clay loam, sandy clay, clay, sandy clay loam.	CL, CH, SC-SM	A-7	0	90-100	90-100	50-100	45-95	45-65	20-35
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 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
WaA---------- Wahee	0-7	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	90-98	51-75	20-35	2-10
	7-48	Clay, clay loam, silty clay.	CL, CH	A-6, A-7	0	100	100	85-100	51-92	38-81	16-54
	48-60	Variable---------	---	---	---	---	---	---	---	---	---
WeB, WeC, WeE---- Wedowee	0-10	Sandy loam-------	SM, SC-SM	A-4, A-2-4	0	95-100	95-100	50-99	23-50	<30	NP-6
	10-36	Sandy clay, clay loam, clay, sandy clay loam, loam.	SC, ML, CL, MH	A-6, A-7	0	95-100	95-100	65-97	45-75	28-58	5-30
	36-63	Sandy clay loam, clay loam, sandy loam, fine sandy loam, loam, sandy clay.	SC, SC-SM, CL, CL-ML	A-2, A-4, A-6	0	95-100	95-100	60-80	30-60	20-54	NP-30
WnF---------- Winton	0-9	Fine sandy loam	ML, SM, CL, SC	A-2, A-4, A-6	0	90-100	90-100	50-99	25-65	<30	NP-15
	9-57	Sandy clay loam, sandy loam, clay loam, fine sandy loam.	SC, CL	A-2, A-4, A-6, A-7	0	90-100	90-100	45-95	25-70	20-45	NP-30
	57-63	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
AaA----------	0-12	0-20	1.30-1.50	2.0-6.0	0.12-0.20	3.6-6.5	Low----------	0.24	5	3	.5-3
Altavista	12-36	18-35	1.30-1.50	0.6-2.0	0.12-0.20	3.6-6.0	Low----------	0.24			
	36-62	---	---	---	---	---	----------	----			
AyA----------	0-10	0-27	1.30-1.60	2.0-6.0	0.15-0.20	4.5-6.0	Low----------	0.37	5	3	1-4
Aycock	10-74	18-35	1.30-1.60	0.2-2.0	0.15-0.20	4.5-5.5	Low----------	0.43			
BaA----------	0-13	7-27	1.20-1.40	0.6-2.0	0.11-0.16	3.6-6.0	Low----------	0.28	5	5	1-6
Bethera	13-63	35-50	1.30-1.50	0.06-0.6	0.14-0.18	3.6-6.0	Moderate-----	0.32			
BcA----------	0-18	0-15	1.20-1.50	6.0-20	0.05-0.10	3.6-6.5	Low----------	0.17	3	2	.5-1
Bojac	18-53	11-16	1.35-1.55	2.0-6.0	0.08-0.16	3.6-6.5	Low----------	0.17			
	53-74	1-8	1.30-1.50	6.0-20.0	0.02-0.07	4.5-6.0	Low----------	0.17			
BoB----------	0-23	0-15	1.30-1.70	6.0-20	0.05-0.11	4.5-6.0	Low----------	0.10	5	2	.5-2
Bonneau	23-36	13-35	1.40-1.60	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.20			
	36-66	15-40	1.40-1.60	0.6-2.0	0.10-0.16	4.5-5.5	Low----------	0.20			
CbA*:											
Chastain--------	0-5	27-40	1.20-1.40	0.06-0.2	0.12-0.16	3.5-6.0	Moderate-----	0.28	5	4	1-6
	5-72	35-60	1.30-1.50	0.06-0.2	0.12-0.16	3.5-6.0	Moderate-----	0.37			
Bibb----------	0-10	7-27	1.40-1.65	0.6-2.0	0.15-0.20	3.6-5.5	Low----------	0.28	5	5	1-3
	10-36	2-18	1.45-1.75	0.6-2.0	0.10-0.20	3.6-5.5	Low----------	0.37			
	36-66	2-12	1.60-1.75	2.0-6.0	0.06-0.10	3.6-5.5	Low----------	0.15			
ChA----------	0-4	7-27	1.30-1.60	0.6-2.0	0.15-0.24	4.5-6.5	Low----------	0.28	5	5	1-4
Chewacla	4-60	18-35	1.30-1.60	0.6-2.0	0.12-0.24	4.5-7.8	Low----------	0.32			
CwA*:											
Chewacla--------	0-4	7-27	1.30-1.60	0.6-2.0	0.15-0.24	4.5-6.5	Low----------	0.28	5	5	1-4
	4-60	18-35	1.30-1.60	0.6-2.0	0.12-0.24	4.5-7.8	Low----------	0.32			
Wehadkee--------	0-7	7-27	1.35-1.60	2.0-6.0	0.10-0.15	4.5-6.5	Low----------	0.24	5	3	2-5
	7-33	18-35	1.30-1.50	0.6-2.0	0.16-0.20	4.5-6.5	Low----------	0.32			
	33-60	---	---	---	---	---	----------	----			
DgA----------	0-8	0-27	1.30-1.45	0.6-2.0	0.14-0.20	3.6-5.5	Low----------	0.37	5	5	.5-1
Dogue	8-13	18-34	1.35-1.50	0.6-2.0	0.14-0.19	3.6-5.5	Low----------	0.28			
	13-40	35-50	1.35-1.50	0.2-0.6	0.10-0.19	4.5-6.0	Moderate-----	0.28			
	40-53	20-50	1.35-1.60	0.06-2.0	0.10-0.18	4.5-6.0	Moderate-----	0.28			
	53-62	5-30	1.30-1.50	0.6-6.0	0.05-0.14	3.6-5.5	Low----------	0.17			
DoA, DoB---------	0-17	0-15	1.30-1.60	2.0-6.0	0.06-0.10	4.5-6.0	Very low-----	0.15	5	2	<.5
Dothan	17-37	18-35	1.40-1.60	0.6-2.0	0.12-0.16	4.5-6.0	Low----------	0.28			
	37-61	21-50	1.45-1.60	0.06-0.6	0.10-0.19	4.5-6.0	Moderate-----	0.28			
	61-72	12-30	1.20-1.50	0.6-2.0	0.08-0.15	3.6-5.5	Low----------	0.28			
EmA, EmB, EmC----	0-10	0-20	1.30-1.40	2.0-6.0	0.10-0.17	4.5-6.0	Low----------	0.28	5	3	.5-2
Emporia	10-17	11-60	1.35-1.55	2.0-6.0	0.08-0.16	3.6-5.5	Low----------	0.17			
	17-43	18-35	1.35-1.45	0.2-2.0	0.10-0.18	4.5-6.0	Low----------	0.28			
	43-58	21-40	1.45-1.60	0.06-0.6	0.10-0.16	4.5-6.0	Moderate-----	0.20			
	58-67	5-40	1.45-1.60	0.06-2.0	0.08-0.18	4.5-6.0	Moderate-----	0.20			

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
ErB*:											
Emporia	0-10	0-20	1.30-1.40	2.0-6.0	0.10-0.17	4.5-6.0	Low	0.28	5	3	.5-2
	10-17	11-60	1.35-1.55	2.0-6.0	0.08-0.16	3.6-5.5	Low	0.17			
	17-43	18-35	1.35-1.45	0.2-2.0	0.10-0.18	4.5-6.0	Low	0.28			
	43-58	21-40	1.45-1.60	0.06-0.6	0.10-0.16	4.5-6.0	Moderate	0.20			
	58-67	5-40	1.45-1.60	0.06-2.0	0.08-0.18	4.5-6.0	Moderate	0.20			
Urban land.											
EwB*:											
Emporia	0-10	0-20	1.30-1.40	2.0-6.0	0.10-0.17	4.5-6.0	Low	0.28	5	3	.5-2
	10-17	11-60	1.35-1.55	2.0-6.0	0.08-0.16	3.6-5.5	Low	0.17			
	17-43	18-35	1.35-1.45	0.2-2.0	0.10-0.18	4.5-6.0	Low	0.28			
	43-58	21-40	1.45-1.60	0.06-0.6	0.10-0.16	4.5-6.0	Moderate	0.20			
	58-67	5-40	1.45-1.60	0.06-2.0	0.08-0.18	4.5-6.0	Moderate	0.20			
Wedowee	0-10	0-20	1.25-1.60	2.0-6.0	0.10-0.18	3.6-5.5	Low	0.24	3	3	.5-3
	10-36	35-45	1.30-1.50	0.6-2.0	0.12-0.18	3.6-5.5	Low	0.28			
	36-63	15-30	1.20-1.50	0.6-2.0	0.08-0.15	3.6-5.5	Low	0.28			
ExA	0-15	0-27	1.30-1.50	2.0-6.0	0.15-0.20	3.6-6.0	Low	0.37	5	3	.5-2
Exum	15-62	18-35	1.30-1.40	0.2-0.6	0.15-0.20	3.6-5.5	Low	0.37			
FuB	0-25	0-10	1.60-1.70	>6.0	0.03-0.07	4.5-6.0	Low	0.10	5	1	.5-2
Fuquay	25-42	10-35	1.40-1.60	0.6-2.0	0.12-0.15	4.5-6.0	Low	0.20			
	42-62	13-35	1.40-1.60	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.20			
	62-70	18-35	1.35-1.45	0.2-2.0	0.10-0.18	4.5-6.0	Low	0.28			
GoA	0-7	0-20	1.40-1.60	2.0-6.0	0.10-0.15	3.6-6.0	Low	0.20	5	3	.5-2
Goldsboro	7-35	18-30	1.30-1.50	0.6-2.0	0.11-0.17	3.6-5.5	Low	0.24			
	35-72	20-34	1.30-1.40	0.6-2.0	0.11-0.20	3.6-5.5	Low	0.24			
GrA	0-12	7-27	1.30-1.50	2.0-6.0	0.13-0.20	3.6-5.5	Low	0.37	5	3	2-4
Grantham	12-75	18-35	1.30-1.40	0.2-0.6	0.15-0.20	3.6-5.5	Low	0.43			
GtB, GtC	0-6	0-20	1.30-1.50	2.0-6.0	0.08-0.12	3.6-6.0	Low	0.32	3	3	.5-2
Gritney	6-57	35-60	1.30-1.50	0.06-0.2	0.10-0.17	3.6-5.5	Moderate	0.32			
	57-60	10-35	1.30-1.50	0.06-6.0	0.06-0.12	3.6-5.5	Low	0.20			
GyB2	0-4	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
Gritney	4-38	35-60	1.30-1.50	0.06-0.2	0.10-0.17	3.6-5.5	Moderate	0.32			
	38-60	10-35	1.30-1.50	0.06-6.0	0.06-0.12	3.6-5.5	Low	0.20			
HeA	0-8	0-20	1.58-1.62	2.0-6.0	0.10-0.12	3.6-6.5	Low	0.24	4	5	.5-2
Helena	8-48	35-60	1.44-1.55	0.06-0.2	0.13-0.15	3.6-5.5	High	0.28			
	48-62	---	---	---	---	---		----			
HrB, HrC	0-8	0-27	1.20-1.40	0.6-2.0	0.14-0.20	4.5-6.5	Low	0.43	5	5	.5-1
Herndon	8-39	35-60	1.30-1.60	0.6-2.0	0.13-0.18	3.6-5.5	Low	0.28			
	39-45	18-35	1.30-1.40	0.2-0.6	0.15-0.20	3.6-5.5	Low	0.37			
	45-61	10-27	1.20-1.40	0.6-2.0	0.05-0.08	3.6-5.5	Low	0.32			
LgA	0-13	0-27	1.20-1.50	0.6-2.0	0.14-0.20	4.5-5.5	Low	0.37	4	3	.5-2
Lignum	13-46	35-55	1.25-1.55	<0.06	0.10-0.18	4.5-5.5	Moderate	0.28			
	46-58	20-40	1.25-1.55	0.2-0.6	0.10-0.18	4.5-5.5	Low	0.28			
	58-63	---	---	0.0-0.06	---	---		----			

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
LyA---------- Lynchburg	0-8	0-20	1.30-1.60	2.0-6.0	0.09-0.13	3.6-5.5	Low----------	0.20	5	3	.5-5
	8-68	18-35	1.30-1.50	0.6-2.0	0.12-0.16	3.6-5.5	Low----------	0.20			
MrA, MrB--------- Marlboro	0-7	0-20	1.30-1.60	2.0-6.0	0.09-0.14	5.1-6.5	Low----------	0.20	5	3	.5-2
	7-66	35-65	1.20-1.50	0.6-2.0	0.14-0.18	4.5-6.0	Low----------	0.20			
	66-74	30-60	1.20-1.50	0.6-2.0	0.12-0.18	4.5-6.0	Low----------	0.20			
NaA---------- Nahunta	0-8	0-27	1.30-1.50	2.0-6.0	0.15-0.20	4.5-6.0	Low----------	0.43	5	3	2-4
	8-75	18-35	1.30-1.40	0.2-0.6	0.15-0.20	3.6-5.5	Low----------	0.43			
NkB---------- Nankin	0-9	0-15	1.45-1.65	2.0-6.0	0.04-0.08	4.5-5.5	Low----------	0.10	3	2	.5-1
	9-52	35-50	1.30-1.70	0.2-0.6	0.11-0.16	4.5-5.5	Low----------	0.24			
	52-64	15-35	1.60-1.90	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.24			
NoA---------- Noboco	0-10	0-20	1.50-1.80	2.0-6.0	0.13-0.15	3.6-6.0	Low----------	0.15	5	---	.5-2
	10-18	0-20	1.30-1.50	2.0-6.0	0.10-0.15	3.6-5.5	Low----------	0.20			
	18-54	18-35	1.45-1.75	0.6-2.0	0.11-0.14	3.6-5.5	Low----------	0.24			
	54-64	20-43	1.45-1.70	0.6-2.0	0.06-0.14	3.6-5.5	Low----------	0.24			
PaB---------- Pacolet	0-8	0-20	1.00-1.50	2.0-6.0	0.08-0.12	4.5-6.5	Low----------	0.20	3	3	.5-2
	8-27	35-65	1.30-1.50	0.6-2.0	0.12-0.15	4.5-6.0	Low----------	0.28			
	27-35	15-30	1.20-1.50	0.6-2.0	0.08-0.15	4.5-6.0	Low----------	0.28			
	35-63	10-25	1.20-1.50	0.6-2.0	0.08-0.15	4.5-6.0	Low----------	0.28			
PeB2---------- Pacolet	0-2	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
	2-21	35-65	1.30-1.50	0.6-2.0	0.12-0.15	4.5-6.0	Low----------	0.28			
	21-28	15-30	1.20-1.50	0.6-2.0	0.08-0.15	4.5-6.0	Low----------	0.28			
	28-64	10-25	1.20-1.50	0.6-2.0	0.08-0.15	4.5-6.0	Low----------	0.28			
RaA---------- Rains	0-7	0-20	1.30-1.60	2.0-6.0	0.10-0.14	3.6-6.5	Low----------	0.20	5	3	1-6
	7-28	18-35	1.30-1.60	0.6-2.0	0.11-0.15	3.6-5.5	Low----------	0.24			
	28-72	18-40	1.30-1.50	0.6-2.0	0.10-0.15	3.6-5.5	Low----------	0.28			
RmA---------- Riverview	0-6	7-27	1.30-1.60	0.6-2.0	0.16-0.24	4.5-6.5	Low----------	0.32	5	5	.5-2
	6-63	18-35	1.20-1.40	0.6-2.0	0.15-0.22	4.5-6.0	Low----------	0.24			
RoA---------- Roanoke	0-8	7-27	1.20-1.50	0.6-2.0	0.14-0.20	3.5-5.5	Low----------	0.37	4	5	.5-2
	8-52	35-60	1.35-1.65	<0.2	0.10-0.19	3.5-5.5	Moderate-----	0.24			
	52-70	5-50	1.20-1.50	0.06-20	0.04-0.14	3.5-5.5	Moderate-----	0.24			
SeA---------- Seabrook	0-9	0-15	1.30-1.60	6.0-20	0.05-0.11	4.5-6.5	Low----------	0.10	5	2	.5-2
	9-63	2-12	1.30-1.60	6.0-20	0.02-0.09	4.5-6.5	Low----------	0.10			
StA, StB--------- State	0-6	0-20	1.25-1.40	0.6-6.0	0.08-0.15	3.6-5.5	Low----------	0.28	5	3	<2
	6-44	18-34	1.35-1.50	0.6-2.0	0.14-0.19	3.6-5.5	Low----------	0.28			
	44-75	2-15	1.35-1.50	>2.0	0.02-0.10	3.6-6.5	Low----------	0.17			
TaA---------- Tarboro	0-9	0-15	1.60-1.75	6.0-20	0.05-0.09	4.5-6.5	Low----------	0.10	5	2	.5-1
	9-82	2-7	1.60-1.75	>20	0.02-0.06	4.5-6.5	Low----------	0.10			
TbE---------- Tatum	0-5	0-27	1.10-1.40	0.6-2.0	0.16-0.20	4.5-5.5	Low----------	0.37	4	3	.5-2
	5-54	45-60	1.40-1.60	0.6-2.0	0.10-0.19	4.5-5.5	Moderate-----	0.28			
	54-63	---	---	0.00-0.06	---	---	----------	----			
TmB2, TmC2------- Tatum	0-6	27-40	1.30-1.50	0.6-2.0	0.14-0.18	4.5-5.5	Low----------	0.32	3	6	0-2
	6-50	45-60	1.40-1.60	0.6-2.0	0.10-0.19	4.5-5.5	Moderate-----	0.28			
	50-62	---	---	0.00-0.06	---	---	----------	----			

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
TtA---------- Tomotley	0-5	0-20	1.30-1.60	2.0-6.0	0.10-0.15	3.6-5.5	Low----------	0.20	5	3	1-6
	5-9	0-27	1.20-1.40	0.6-2.0	0.05-0.08	3.6-5.5	Low----------	0.32			
	9-31	18-35	1.30-1.50	0.6-2.0	0.12-0.18	3.6-5.5	Low----------	0.20			
	31-45	15-45	1.30-1.60	0.2-2.0	0.12-0.18	3.6-6.0	Low----------	0.20			
	45-60	---	---	---	---	---	----------	----			
TuB---------- Turbeville	0-9	0-20	1.35-1.55	2.0-6.0	0.08-0.15	4.5-5.5	Low----------	0.32	5	3	.5-2
	9-12	25-40	1.30-1.45	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.28			
	12-86	30-60	1.35-1.50	0.6-2.0	0.13-0.16	4.5-5.5	Moderate-----	0.24			
Ud. Udorthents											
WaA---------- Wahee	0-7	0-27	1.20-1.50	0.2-2.0	0.15-0.20	4.5-6.0	Low----------	0.28	5	5	.5-5
	7-48	35-60	1.40-1.60	0.06-0.2	0.12-0.20	3.6-5.5	Moderate-----	0.28			
	48-60	---	---	---	---	---	----------	----			
WeB, WeC, WeE---- Wedowee	0-10	0-20	1.25-1.60	2.0-6.0	0.10-0.18	3.6-5.5	Low----------	0.24	3	3	.5-3
	10-36	35-45	1.30-1.50	0.6-2.0	0.12-0.18	3.6-5.5	Low----------	0.28			
	36-63	15-30	1.20-1.50	0.6-2.0	0.08-0.15	3.6-5.5	Low----------	0.28			
WnF---------- Winton	0-9	0-20	1.30-1.40	2.0-6.0	0.12-0.20	3.6-6.0	Low----------	0.20	5	5	.5-3
	9-57	18-35	1.30-1.50	0.2-2.0	0.12-0.20	3.6-6.0	Low----------	0.24			
	57-63	---	---	---	---	---	----------	----			

* 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	Hydro-logic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Bedrock: Depth	Bedrock: Hard-ness	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					Ft			In			
AaA Altavista	C	Rare	---	---	1.5-2.5	Apparent	Dec-Apr	>60	---	Moderate	Moderate.
AyA Aycock	B	None	---	---	3.5-6.0	Apparent	Jan-Apr	>60	---	Moderate	High.
BaA Bethera	D	None	---	---	0-1.5	Apparent	Dec-Apr	>60	---	High	High.
BcA Bojac	B	None	---	---	4.0-6.0	Apparent	Nov-Apr	>60	---	Low	High.
BoB Bonneau	A	None	---	---	3.0-5.0	Apparent	Dec-Mar	>60	---	Low	High.
CbA*:											
Chastain	D	Frequent	Very long	Nov-Jun	0-1.0	Apparent	Nov-May	>60	---	High	High.
Bibb	D	Frequent	Brief to long.	Dec-May	0.5-1.0	Apparent	Dec-Apr	>60	---	High	Moderate.
ChA Chewacla	C	Occasional	Brief to long.	Nov-Apr	0.5-1.5	Apparent	Nov-Apr	>60	---	High	Moderate.
CwA*:											
Chewacla	C	Frequent	Brief to long.	Nov-Apr	0.5-1.5	Apparent	Nov-Apr	>60	---	High	Moderate.
Wehadkee	D	Frequent	Brief to long.	Nov-Jun	0-1.0	Apparent	Nov-May	>60	---	High	Moderate.
DgA Dogue	C	None	---	---	1.5-3.0	Apparent	Jan-Mar	>60	---	High	High.
DoA, DoB Dothan	B	None	---	---	3.0-5.0	Perched	Jan-Apr	>60	---	Moderate	Moderate.
EmA, EmB, EmC Emporia	C	None	---	---	3.0-4.5	Perched	Nov-Apr	>60	---	Moderate	High.
ErB*:											
Emporia	C	None	---	---	3.0-4.5	Perched	Nov-Apr	>60	---	Moderate	High.
Urban land.											
EwB*:											
Emporia	C	None	---	---	3.0-4.5	Perched	Nov-Apr	>60	---	Moderate	High.
Wedowee	B	None	---	---	>6.0	---	---	>60	---	Moderate	High.
ExA Exum	C	None	---	---	2.0-3.0	Apparent	Dec-Apr	>60	---	Moderate	High.

See footnote at end of table.

Table 15.—Soil and Water Features—Continued

Soil name and map symbol	Hydro-logic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Bedrock: Depth	Bedrock: Hard-ness	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					Ft			In			
FuB---------- Fuquay	B	None--------	---	---	4.0-6.0	Perched	Jan-Mar	>60	---	Low------	High.
GoA---------- Goldsboro	B	None--------	---	---	2.0-3.0	Apparent	Dec-Apr	>60	---	Moderate	High.
GrA---------- Grantham	D	None--------	---	---	0-1.0	Apparent	Dec-May	>60	---	High-----	High.
GtB, GtC, GyB2---- Gritney	C	None--------	---	---	1.5-3.0	Perched	Dec-Apr	>60	---	High-----	High.
HeA---------- Helena	C	None--------	---	---	1.5-2.5	Perched	Jan-Apr	>60	---	High-----	High.
HrB, HrC---------- Herndon	B	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
LgA---------- Lignum	C	None--------	---	---	1.0-2.5	Perched	Dec-May	40-60	Soft	High-----	High.
LyA---------- Lynchburg	C	None--------	---	---	0.5-1.5	Apparent	Nov-Apr	>60	---	High-----	High.
MrA, MrB---------- Marlboro	B	None--------	---	---	4.0-6.0	Apparent	Dec-Mar	>60	---	High-----	High.
NaA---------- Nahunta	C	None--------	---	---	1.0-2.5	Apparent	Dec-May	>60	---	High-----	High.
NkB---------- Nankin	C	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
NoA---------- Noboco	B	None--------	---	---	2.5-4.0	Apparent	Dec-Mar	>60	---	Moderate	High.
PaB, PeB2--------- Pacolet	B	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
RaA---------- Rains	B/D	None--------	---	---	0-1.0	Apparent	Nov-Apr	>60	---	High-----	High.
RmA---------- Riverview	B	Occasional	Brief-----	Dec-Mar	3.0-5.0	Apparent	Dec-Mar	>60	---	Low------	Moderate.
RoA---------- Roanoke	D	Occasional	Brief-----	Nov-Jun	0-1.0	Apparent	Nov-May	>60	---	High-----	High.
SeA---------- Seabrook	C	Rare--------	---	---	2.0-3.5	Apparent	Dec-Mar	>60	---	Low------	Moderate.
StA, StB---------- State	B	None--------	---	---	4.0-6.0	Apparent	Dec-Jun	>60	---	Moderate	High.
TaA---------- Tarboro	A	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
TbE, TmB2, TmC2--- Tatum	B	None--------	---	---	>6.0	---	---	40-60	Soft	High-----	High.

See footnote at end of table.

Table 15.—Soil and Water Features—Continued

Soil name and map symbol	Hydro-logic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Bedrock: Depth	Bedrock: Hard-ness	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					Ft			In			
TtA---------- Tomotley	B/D	Rare--------	---	---	0-1.0	Apparent	Nov-Apr	>60	---	High-----	High.
TuB---------- Turbeville	C	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
Ud. Udorthents											
WaA---------- Wahee	D	Rare--------	---	---	0.5-1.5	Apparent	Dec-Mar	>60	---	High-----	High.
WeB, WeC, WeE----- Wedowee	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	High.
WnF---------- Winton	C	None--------	---	---	2.0-3.5	Perched	Dec-May	>60	---	Moderate	Moderate.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 16.—Classification of the Soils

Soil name	Family or higher taxonomic class
Altavista	Fine-loamy, mixed, thermic Aquic Hapludults
Aycock	Fine-silty, siliceous, thermic Typic Paleudults
Bethera	Clayey, mixed, thermic Typic Paleaquults
Bibb	Coarse-loamy, siliceous, acid, thermic Typic Fluvaquents
Bojac	Coarse-loamy, mixed, thermic Typic Hapludults
Bonneau	Loamy, siliceous, thermic Arenic Paleudults
Chastain	Fine, mixed, acid, thermic Typic Fluvaquents
Chewacla	Fine-loamy, mixed, thermic Fluvaquentic Dystrochrepts
Dogue	Clayey, mixed, thermic Aquic Hapludults
Dothan	Fine-loamy, siliceous, thermic Plinthic Kandiudults
Emporia	Fine-loamy, siliceous, thermic Typic Hapludults
Exum	Fine-silty, siliceous, thermic Aquic Paleudults
Fuquay	Loamy, siliceous, thermic Arenic Plinthic Kandiudults
Goldsboro	Fine-loamy, siliceous, thermic Aquic Paleudults
Grantham	Fine-silty, siliceous, thermic Typic Paleaquults
Gritney	Clayey, mixed, thermic Aquic Hapludults
Helena	Clayey, mixed, thermic Aquic Hapludults
Herndon	Clayey, kaolinitic, thermic Typic Hapludults
Lignum	Clayey, mixed, thermic Aquic Hapludults
Lynchburg	Fine-loamy, siliceous, thermic Aeric Paleaquults
Marlboro	Clayey, kaolinitic, thermic Typic Paleudults
Nahunta	Fine-silty, siliceous, thermic Aeric Paleaquults
Nankin	Clayey, kaolinitic, thermic Typic Kanhapludults
Noboco	Fine-loamy, siliceous, thermic Typic Paleudults
Pacolet	Clayey, kaolinitic, thermic Typic Kanhapludults
Rains	Fine-loamy, siliceous, thermic Typic Paleaquults
Riverview	Fine-loamy, mixed, thermic Fluventic Dystrochrepts
Roanoke	Clayey, mixed, thermic Typic Endoaquults
Seabrook	Mixed, thermic Aquic Udipsamments
State	Fine-loamy, mixed, thermic Typic Hapludults
Tarboro	Mixed, thermic Typic Udipsamments
Tatum	Clayey, mixed, thermic Typic Hapludults
Tomotley	Fine-loamy, mixed, thermic Typic Endoaquults
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
Winton	Fine-loamy, mixed, thermic Aquic Hapludults