United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with Tennessee Agricultural Experiment Station, Tennessee Department of Agriculture, and Jackson County Board of Commissioners

Soil Survey of Jackson County, Tennessee

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.

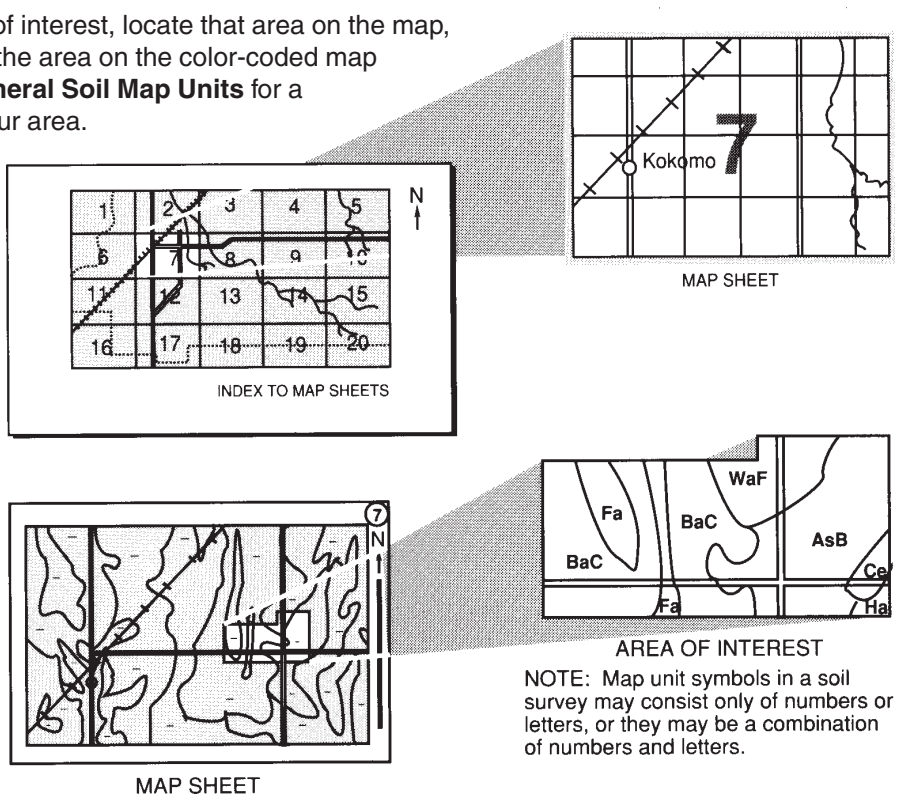
To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

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 unit 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 Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1994. Soil names and descriptions were approved in 1996. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1994. This survey was made cooperatively by the Natural Resources Conservation Service, Tennessee Agricultural Experiment Station, Tennessee Department of Agriculture, and Jackson County Board of Commissioners. The survey is part of the technical assistance furnished to the Jackson County Soil Conservation District.

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.

Cover: Most of the cleared land in Jackson County is used for the production of hay and pasture. Ocana gravelly silt loam, occasionally flooded, is in the narrow valley in the foreground. Dellrose gravelly silt loam, 12 to 20 percent slopes, eroded, is on the moderately steep hillside in the background. It is well suited to tall fescue and ladino clover used for hay.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service homepage on the World Wide Web. The address is http://www.nrcs.usda.gov.

Contents

Foreword

This soil survey contains information that affects land use planning in this survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, 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 land use 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 land use or land treatment decisions. 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 to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

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

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State Conservationist
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Soil Survey of
Jackson County, Tennessee

Fieldwork by Terry Henry and Howard G. Smith, Natural Resources Conservation Service, and John G. Gibi, private consulting soil scientist

United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with
the Tennessee Agricultural Experiment Station, Tennessee Department of Agriculture, and Jackson County Board of Commissioners

JACKSON COUNTY is located in the north-central part of Tennessee (fig. 1). It is bounded on the north by Clay County, on the east by Overton County, on the south by Putnam County, and on the west by Smith and Macon Counties. In 1990, the population of the county was 9,297. The city of Gainesboro, the county seat, is located in the center of the county on Dow Creek, 1 mile south of the Cumberland River. The county makes up 206,000 acres, or approximately 322 square miles.

The two major economic enterprises in the county are agriculture and industry. Burley tobacco, the main cash crop, and beef cattle production are the major agricultural enterprises. Other important crops grown in the county include corn, wheat, soybeans, and hay. Swine and dairy operations are also important to the local economy.

This soil survey updates the survey of Jackson County published in 1915 (USDA 1915).

General Nature of the County

This section gives information about the county. It describes history and development; industry and transportation; geology, physiography, and drainage; and climate.

History and Development

Jackson County was established by an act of the General Assembly of the Tennessee Legislature on November 6, 1801. Originally, Jackson County included all of what is now Overton County, a majority of Clay County, and parts of Putnam and DeKalb Counties. The county was named in honor of General Andrew Jackson, a distinguished soldier and later a statesman and the Nation's president. Most of the early settlers came from the Carolinas or Virginia or from areas in eastern Tennessee. The town of Gainesboro, the county seat, was established in 1817 and was named in honor of General Edmond Pendleton Gaines, who served with General Jackson in many campaigns (Goodspeed 1887).

Industry and Transportation

Industries within Jackson County include manufacturing of clothing, furniture, and molded plastics; agriculture; construction; transportation; communications; wholesale and retail trades; and public services. Several factories within the county provide income to many local residents.

Jackson County possesses a very efficient system of eight state and numerous county highways. The excellent network of county and state highways makes every part of the county accessible for easy movement of farm products and freight. The Cumberland River runs through the county and is an important navigable waterway for river commerce. Nashville is the nearest port facility. Nashville International Airport is the nearest commercial airport.

Geology, Physiography, and Drainage

Jackson County is located in two physiographic regions—the Highland Rim and the Central Basin. The Highland Rim is of Mississippian age. The four geologic formations that make up the Highland Rim

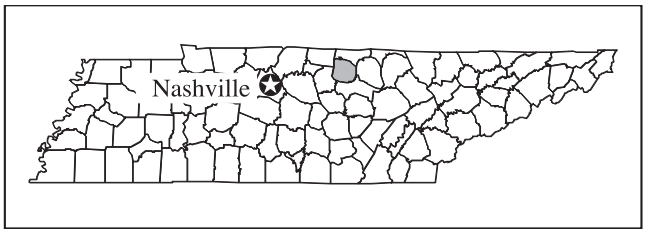

Figure 1.—Location of Jackson County in Tennessee.

region in Jackson County are St. Louis Limestone, Warsaw Limestone, Fort Payne, and Maury Shale. The Central Basin is of Ordovician age. The five geologic formations that make up the Central Basin region in the county are Chattanooga Shale, Leipers, Catheys, Bigby-Cannon, and Hermitage.

The St. Louis Limestone Formation is of minor extent in the county. It is in the highest positions on broad upland flats, at elevations of 1,100 feet or more. The formation consists of medium gray to medium dark gray and brownish to light olive gray limestone. The thickness of the formation ranges from 100 to 160 feet.

The Warsaw Limestone Formation is of greater extent in Jackson County. It includes sandy limestone, limestone, and a combination of calcareous siltstone, calcareous shale, and argillaceous limestone. The formation is on broad upland flats and ridgetops, generally at elevations of 1,000 feet or more. The greatest evidence of Warsaw Limestone is in southern Jackson County, along the Putnam County line. The thickness of the formation ranges from 5 to 160 feet.

The Fort Payne Formation is characterized by interbedded and disseminated chert, shale, and siltstone and a few dolomitic zones. Some of these zones are composed entirely of large masses of crinoid fragments. The Fort Payne Formation has the largest exposure of the Highland Rim region in Jackson County and is on most hillsides and the lower footslopes. The thickness of the Fort Payne Formation ranges from 80 to 300 feet.

Maury Shale is at the base of the Fort Payne Formation. It was formed by the deposition of greenish gray mud, which marked the beginning of the Mississippian Period. It is characterized by fossils, including fish bone fragments. Maury Shale is only 1 or 2 feet thick and grades quickly into the first deposit of the outer Central Basin.

Chattanooga Shale is grayish black, very thinly laminated, carbonaceous shale. It is in the lower Mississippian and upper Devonian Systems and is the geologic separation between the Highland Rim and Central Basin physiographic regions. The thickness of the Chattanooga Shale ranges from 20 to 25 feet.

Leipers and Catheys Formations make up the largest extent of the outer Central Basin in the county. They are dark gray to brownish gray limestone. The thickness of the Leipers and Catheys Formations ranges from 20 to 300 feet.

The Bigby-Cannon Formation is of minor extent in the county. It is exposed on stream terraces along the Cumberland River and its major tributaries. The thickness of the Bigby-Cannon Formation ranges from 10 to 140 feet.

The Hermitage Formation is exposed only along Martin Creek in the county. It is medium to dark gray, argillaceous limestone and shale. The thickness of the Hermitage Formation ranges from 5 to 80 feet (Miller 1974).

The topography in the northern and western parts of the county is characterized by narrow, rolling ridges adjacent to steep or very steep hillsides. These areas are highly dissected by narrow drainageways. The soils are well drained.

Transecting the center of the county are long, narrow flood plains and stream terraces adjacent to the Cumberland River. The soils in these areas range from excessively drained to poorly drained.

The topography in the northeastern part of the county is characterized by undulating or rolling ridges and moderately steep or steep hillsides. The soils are well drained. Karst landforms are in several areas. They are characterized by a series of sinkholes and no apparent surface drainage.

The topography in the southeastern part of the county is characterized by undulating ridges adjoining moderately steep or steep hillsides along drainageways. Generally, the soils are well drained or moderately well drained. In several areas the topography is characterized by nearly level flats where runoff collects from adjacent side slopes and where the drainage pattern is indistinct and the soils are imperfectly drained.

Jackson County is drained by two major river systems—the Cumberland River and the Roaring River. The Cumberland River flows from the northeast to the southwest across the center of the county. The mean water depth is controlled by the Cordell Hull Dam, a U.S. Army Corps of Engineers facility located in Smith County. The Roaring River flows from east to west across the central section of the county and joins the Cumberland River just north of the city of Gainesboro. Flood plains on both river systems are long and narrow, with adjacent stream terraces along most of their length. The flood plains of the two rivers

and their major tributaries are subject to occasional flooding during periods of heavy rainfall. Many areas along both rivers have nearly vertical rock bluffs adjacent to the stream channels.

Climate

Data provided by the National Water and Climate Center, Natural Resources Conservation Service, Portland, Oregon.

Data for the climate tables were collected at the climate station at Cookeville, Tennessee, in nearby Putnam County because there are no long-term climate stations in Jackson County. Other climate data, including the number of days of thunderstorms, the relative humidity, the percentage of sunshine, and information about wind, were estimated based on data from a climate station at Nashville, Tennessee.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Cookeville 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 the length of the growing season.

In winter, the average temperature is 36.6 degrees F and the average daily minimum temperature is 26.2 degrees. The lowest temperature on record, which occurred at Cookeville on January 21, 1985, was -22 degrees. In summer, the average temperature is 74.5 degrees and the average daily maximum temperature is 85.9 degrees. The highest temperature, which occurred at Cookeville on July 17, 1980, was 104 degrees.

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

The average annual total precipitation is 56.59 inches. Of this, about 31.40 inches, or 56 percent, usually falls in April through October. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 6.06 inches at Cookeville on September 29, 1964. Thunderstorms occur on about 53 days each year, and most occur between May and August.

The average seasonal snowfall is 9.5 inches. The greatest snow depth at any one time during the period of record was 10 inches recorded on November 3, 1966. On an average, 10 days per year have at least 1 inch of snow on the ground.

The average relative humidity in midafternoon is about 57 percent. Humidity is higher at night, and the average at dawn is about 84 percent. The sun shines 64 percent of the time in summer and 43 percent in winter. The prevailing wind is from the south. Average wind speed is highest, around 10 miles per hour, in March.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept or model of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area 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-vegetation-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 soils. After describing the soils in the survey area 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. Soil taxonomy, 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 generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and 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.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. 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 fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

General Soil Map Units

The general soil map in this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The components of one map 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 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. Hawthorne

Moderately deep, rolling to very steep, somewhat excessively drained soils formed in loamy residuum derived from interbedded siltstone and limestone; on highly dissected uplands

Setting

Slope: 5 to 70 percent

Composition

Extent of map unit: 50 percent of the survey area
Composition of map unit:
Hawthorne soils—91 percent
Minor soils—9 percent

Soil Properties and Qualities

Drainage class: Somewhat excessively drained
Landscape position: Narrow, rolling ridgetops and steep hillsides
Parent material: Loamy residuum derived from interbedded siltstone and limestone
Surface texture: Gravelly silt loam
Slope: 2 to 70 percent

Minor Soils

- Sugargrove soils on rolling ridgetops and shoulder slopes
- Dellrose soils on footslopes and the lower part of steep hillsides
- Skidmore and Ocana soils along narrow, intermittent drainageways
- Mimosa soils on footslopes
- Armour soils on undulating stream terraces

Map Unit Suitability

Cropland

Most of this unit is poorly suited or unsuited to cropland because of the steep slopes, the depth to rock, a low available water capacity, and the hazard of erosion. The minor soils in a few undulating areas are suited to cropland; however, the small size and narrow shape of the areas limit the selection of plants and accessibility of the unit.

Pasture and Hay

This unit is poorly suited to pasture and hay because of the low available water capacity and the steep slopes.

Woodland

In some areas the Hawthorne soils are suited to drought-tolerant species. Planting selected seedlings on east- and north-facing slopes helps to overcome the droughtiness.

Residential and Commercial Uses

The less sloping soils on ridgetops may be suited to residential and commercial uses if the depth of the soil is adequate. Onsite investigation is needed in those areas. The soils on hillsides are poorly suited to these uses because of the depth to rock, the susceptibility to seepage by effluent, a hazard of slippage on side slopes, and the steep slopes.

2. Barfield-Dellrose-Gladdice-Rock outcrop

Rock outcrop and shallow to very deep, hilly and steep, well drained soils formed in clayey limestone residuum and loamy colluvium; on highly dissected uplands

Setting

Slope: 12 to 70 percent

Composition

Extent of map unit: 30 percent of the survey area
Composition of map unit:
Barfield soils—40 percent
Dellrose soils—18 percent
Gladdice soils—16 percent
Rock outcrop—15 percent
Minor soils—11 percent

Soil Properties and Qualities

Barfield

Drainage class: Well drained
Landscape position: Steep hillsides
Parent material: Clayey limestone residuum
Surface texture: Silty clay
Slope: 15 to 70 percent

Dellrose

Drainage class: Well drained
Landscape position: Steep, dissected hillsides and footslopes
Parent material: Loamy colluvium derived from interbedded limestone and siltstone
Surface texture: Gravelly silt loam
Slope: 12 to 45 percent

Gladdice

Drainage class: Well drained
Landscape position: Steep, dissected hillsides
Parent material: Clayey limestone residuum
Surface texture: Silty clay loam
Slope: 15 to 70 percent

Rock outcrop

The Rock outcrop occurs as horizontal ledges of limestone in scattered areas throughout this unit. In some areas large limestone boulders are on the lower slopes.

Minor Soils

- Hawthorne and Sugargrove soils on the upper part of hillsides
- Christian soils on the upper part of hillsides in areas of the Highland Rim
- Skidmore and Staser soils along narrow, intermittent drainageways
- Mimosa soils on footslopes
- Armour soils on undulating stream terraces

Map Unit Suitability

Cropland

This unit is unsuited to cropland because of the slope, the rock outcrop, the depth to hard bedrock, a low available water capacity, and the hazard of erosion.

Pasture and Hay

The Dellrose soils on footslopes are suited to pasture in some areas. The Barfield and Gladdice soils are poorly suited to pasture and hay because of the numerous areas of rock outcrop, the low available water capacity, and the steep slopes.

Woodland

Most areas of this unit are suited to woodland. The Dellrose soils on the lower part of footslopes are well suited to trees. The Barfield and Gladdice soils are suited to drought-tolerant species. Planting selected seedlings on east- and north-facing slopes helps to overcome the droughtiness.

Residential and Commercial Uses

This unit is poorly suited to residential and commercial uses. Some areas of the Dellrose soils may be used for these purposes; however, the steep slopes, the susceptibility to downslope seepage, and a hazard of hillside slippage are limitations. Onsite investigation is needed when the use and management of specific sites are planned.

3. Christian-Mountview-Dickson

Very deep, undulating to hilly, well drained and moderately well drained soils formed in a silty mantle underlain by limestone residuum; on uplands

Setting

Slope: 2 to 20 percent

Composition

Extent of map unit: 16 percent of the survey area
Composition of map unit:
Christian soils—41 percent
Mountview soils—33 percent
Dickson soils—16 percent
Minor components—10 percent

Soil Properties and Qualities

Christian

Drainage class: Well drained
Landscape position: Ridgetops and hillsides
Parent material: Limestone residuum
Surface texture: Silt loam
Slope: 2 to 20 percent

Mountview

Drainage class: Well drained and moderately well drained
Landscape position: Rolling and undulating ridgetops
Parent material: A silty mantle underlain by limestone residuum
Surface texture: Silt loam
Slope: 2 to 12 percent

Dickson

Drainage class: Moderately well drained
Landscape position: Undulating ridgetops
Parent material: A silty mantle underlain by limestone residuum
Surface texture: Silt loam
Slope: 2 to 8 percent

Minor Components

- Hawthorne soils on steep hillsides
- Bewleyville soils on undulating uplands
- Humphreys soils on footslopes
- Sugargrove soils on narrow, rolling ridgetops
- Ocana soils on flood plains
- Barfield soils and rock outcrop on the lower hills

Map Unit Suitability

Cropland

The soils on the undulating and rolling uplands are well suited to crop production. The hazard of erosion in sloping areas and a restricted rooting depth are the main management concerns.

Pasture and Hay

The soils in this unit are well suited to pasture and hay.

Woodland

Most areas of this unit are well suited to woodland.

Residential and Commercial Uses

The Mountview and Christian soils in the less sloping areas are suited to most residential and commercial uses. The Dickson soils have a fragipan in the subsoil. They are poorly suited to these uses because of the seasonal wetness and slow permeability.

4. Holston-Arrington-Staser

Very deep, nearly level to hilly, well drained soils formed in loamy alluvium; on flood plains and stream terraces

Setting

Slope: 0 to 20 percent

Composition

Extent of map unit: 4 percent of the survey area
Composition of map unit:
Holston soils—35 percent
Arrington soils—20 percent
Staser soils—12 percent
Minor soils—33 percent

Soil Properties and Qualities

Holston

Drainage class: Well drained
Landscape position: Undulating to hilly stream terraces along the Cumberland River and its major tributaries
Parent material: Loamy alluvium
Surface texture: Loam
Slope: 2 to 20 percent

Arrington

Drainage class: Well drained
Landscape position: Flood plains
Parent material: Loamy alluvium
Surface texture: Silt loam
Slope: 0 to 2 percent

Staser

Drainage class: Well drained
Landscape position: Natural levees on flood plains
Parent material: Loamy alluvium
Surface texture: Loam
Slope: 0 to 2 percent

Minor Soils

- Armour soils on undulating or rolling stream terraces
- Minter and Lindside soils on flood plains

Figure 2.—An area of the Holston-Arrington-Staser general soil map unit. This unit is well suited to soybeans that are planted later in the season, when flooding is not a hazard.

- Swafford soils on undulating stream terraces
- Skidmore soils on natural levees and gravel bars of secondary streams
- Mimosa and Sykes soils on footslopes

Map Unit Suitability

Cropland

The soils on the undulating and rolling stream terraces and the nearly level flood plains are well suited to crop production. The frequency of flooding and the hazard of erosion in sloping areas are management concerns (fig. 2). Soils that have slopes of more than 12 percent and all severely eroded soils are poorly suited to cropland because of the hazard of erosion.

Pasture and Hay

Most of the soils in this unit are well suited to pasture and hay. The hilly areas of the Armour and Holston soils are suited to pasture and hay, but more intensive pasture management is needed to help prevent overgrazing and erosion.

Woodland

Most of this unit is well suited to woodland.

Residential and Commercial Uses

The Holston soils in the nearly level to rolling areas are well suited to most residential and commercial uses. The Arrington and Staser soils are poorly suited to these uses because of the flooding.

Detailed Soil Map Units

The map units delineated on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. 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 other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties 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, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives 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, 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, slope, stoniness, salinity, 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 phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Armour silt loam, 5 to 12 percent slopes, eroded, is a phase of the Armour series.

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

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Barfield-Gladdice-Rock outcrop complex, 20 to 70 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas 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 or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Dellrose and Mimosa soils, 20 to 60 percent slopes, is an undifferentiated group in this survey area.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

AmB—Armour silt loam, 2 to 5 percent slopes

Setting

Landscape position: Undulating stream terraces
Shape of areas: Irregular
Size of areas: 10 to 40 acres
Major land use: Cropland

Typical Profile

Surface layer:
0 to 9 inches; brown silt loam
Subsurface layer:
9 to 13 inches; dark yellowish brown silt loam
Subsoil:
13 to 18 inches; dark yellowish brown silty clay loam with brownish mottles
18 to 23 inches; dark yellowish brown silty clay loam with brownish mottles
23 to 41 inches; strong brown silty clay loam with yellowish, reddish, and brownish mottles
41 to 80 inches; strong brown silty clay loam with brownish and yellowish mottles

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Soil reaction: Moderately acid or strongly acid, except where lime has been added
Flooding: None
Seasonal high water table: None
Depth to bedrock: More than 5 feet

Inclusions

- Small areas of Humphreys soils on terrace escarpments and footslopes
- Small areas of Sykes and Mimosa soils in the higher positions on stream terraces

Use and Management

Cropland
Suitability: Well suited
Management considerations:
- Most locally adapted crops can be grown and can produce good yields.
- This soil is susceptible to erosion, which can result in removal of valuable topsoil.
- No-till planting, contour farming, and stripcropping help to control erosion and maintain productivity.

Capability subclass: 2e

Pasture and Hay
Suitability: Well suited
Management considerations:
- No significant limitations affecting forage production if erosion is controlled.
- Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.
- Alfalfa grows well and produces good yields in areas where lime and fertilizer applications are adequate and other necessary management practices have been applied.

Woodland
Suitability: Well suited
Trees suitable for planting: Yellow poplar, black walnut, white oak, southern red oak, hickory, eastern white pine, loblolly pine
Management considerations:
- The main consideration affecting management of timber is the hazard of soil rutting.
- See table 8a for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Well suited
Management considerations:
- Low strength is a limitation on sites for local roads and streets.
- Adding coarser textured base material helps to prevent the damage to local roads and streets caused by low strength.

AmC2—Armour silt loam, 5 to 12 percent slopes, eroded

Setting

Landscape position: Rolling stream terraces
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major land use: Hay, pasture, or, in some areas, cropland

Typical Profile

Surface layer:
0 to 9 inches; brown silt loam with brownish mottles
Subsoil:
9 to 20 inches; dark yellowish brown silty clay loam with brownish mottles
20 to 36 inches; strong brown silty clay loam with yellowish, reddish, and brownish mottles
36 to 80 inches; strong brown silty clay loam with brownish and yellowish mottles

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Soil reaction: Strongly acid or moderately acid, except where lime has been added
Flooding: None
Seasonal high water table: None
Depth to bedrock: More than 5 feet

Inclusions

- Small areas of Humphreys soils on footslopes
- Mimosa soils at the base of footslopes
- Narrow strips of Arrington soils in the lower areas, adjacent to stream channels

Use and Management

Cropland
Suitability: Suited
Management considerations:
- Accelerated erosion can remove valuable topsoil and adversely affect rooting depth.
- Conservation measures, such as no-till planting and contour stripcropping, help to control erosion and reduce the runoff rate.
- Tilth can be improved or maintained by applying a cropping sequence that includes grasses, legumes, or a mixture of grasses and legumes; using proper crop rotations; minimizing tillage; and planting cover crops.

Capability subclass: 3e

Pasture and Hay
Suitability: Well suited
Management considerations:
- Because of the slope, additional erosion is a hazard if plants are overgrazed or if the plant stand is in poor condition.
- Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.
- Alfalfa grows well and produces good yields in areas where lime and fertilizer applications are adequate and other necessary management practices have been applied.

Woodland
Suitability: Well suited
Trees suitable for planting: Yellow poplar, black walnut, white oak, southern red oak, hickory, eastern white pine, loblolly pine
Management considerations:
- The main consideration affecting management of timber is the hazard of soil rutting.
- See table 8a for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Suited
Management considerations:
- Low strength is the major limitation on sites for local roads and streets.
- The slope is a limitation on sites for dwellings and small commercial buildings.
- Adding coarser textured base material helps to prevent the damage to local roads and streets caused by low strength.
- Construction costs and proper design are major considerations if sites for dwellings and small commercial buildings are excavated or filled.

AmD2—Armour silt loam, 12 to 20 percent slopes, eroded

Setting

Landscape position: Hilly stream terraces, north of the Cumberland River
Shape of areas: Narrow
Size of areas: 5 to 50 acres
Major land use: Pasture or woodland

Typical Profile

Surface layer:
0 to 9 inches; brown silt loam with brownish mottles
Subsoil:
9 to 20 inches; dark yellowish brown silty clay loam with brownish mottles

20 to 36 inches; strong brown silty clay loam with yellowish, reddish, and brownish mottles
36 to 80 inches; strong brown silty clay loam with brownish and yellowish mottles

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Soil reaction: Strongly acid or moderately acid, except where lime has been added
Flooding: None
Seasonal high water table: None
Depth to bedrock: More than 5 feet

Inclusions

- Small, intermingled areas of Mimosa soils on short, steep side slopes
- A few small areas of rock outcrop on the lower part of hillsides
- Small areas of severely eroded soils that have a surface layer of silty clay loam

Use and Management

Cropland
Suitability: Poorly suited
Management considerations:
- This soil should not be used continuously as cropland because of the slope and the high erosion potential.
- Contour farming and a crop rotation system in which a vegetative cover is maintained for several seasons following cultivation help to control erosion.
- Conservation measures, such as no-till planting and contour stripcropping, help to control erosion and reduce the runoff rate.

Capability subclass: 4e

Pasture and Hay
Suitability: Suited
Management considerations:
- Because of the slope, additional erosion is a hazard if plants are overgrazed or if the plant stand is in poor condition.
- Pastures should be renovated when the amount of better forage plants in stands has decreased to less than needed for optimum production.
- Adjusting stocking rates, especially in areas on the steeper slopes, helps to prevent overgrazing and control erosion.
- Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.

Woodland
Suitability: Suited
Trees suitable for planting: Yellow poplar, black walnut, white oak, southern red oak, hickory, eastern white pine, loblolly pine
- The main considerations in managing for timber are the suitability for log landings, the hazard of soil rutting, the hazard of erosion on roads and trails, the suitability for roads, the suitability for mechanical planting, and the suitability for mechanical site preparation.
- See tables 8a, 8b, 8c, and 8d for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Poorly suited
Management considerations:
- The slope is the major limitation on sites for septic tank absorption fields, dwellings, and small commercial buildings.
- Low strength and the slope are major limitations on sites for roads and streets.
- Construction costs and proper design are major considerations if sites for dwellings and small commercial buildings are excavated or filled.
- Building roads and streets in the less sloping areas reduces the amount of cut and fill needed.
- Adding coarser textured base material helps to prevent the damage to local roads and streets caused by low strength.

Ar—Arrington silt loam, occasionally flooded

Setting

Landscape position: Flood plains (fig. 3)
Shape of areas: Long, narrow, and nearly level
Size of areas: 5 to 100 acres
Slope: 0 to 2 percent
Major land use: Cropland

Typical Profile

Surface layer:
0 to 10 inches; dark brown silt loam
Subsurface layer:
10 to 37 inches; dark brown silt loam with brownish mottles
Subsoil:
37 to 55 inches; dark yellowish brown silty clay loam with brownish mottles
Substratum:
55 to 80 inches; yellowish brown silt loam

Figure 3.—An area of Arrington silt loam, occasionally flooded, on a nearly level flood plain. This soil is well suited to fescue hay. A pastured area of Mimosa silty clay loam, 12 to 20 percent slopes, eroded, and a wooded area of Hawthorne gravelly silt loam, 20 to 70 percent slopes, are in the background.

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Soil reaction: Slightly acid or neutral
Flooding: Occasional; very brief periods in winter and early spring
Seasonal high water table: None
Depth to bedrock: More than 5 feet

Inclusions

- Small areas of Skidmore and Staser soils along natural stream levees
- Poorly drained Minter soils and moderately well drained Lindside soils in depressions and in narrow strips adjacent to steep upland side slopes
- Armour soils on low stream terraces

Use and Management

Cropland
Suitability: Well suited
Management considerations:
- Most locally adapted crops can be grown and can produce good yields.
- Small grain crops produce good yields, but they can be damaged by the occasional flooding.
- The flooding, which occurs in winter and early spring, is not a limitation affecting management.

Capability subclass: 2w

Pasture and Hay
Suitability: Well suited

Management considerations:
• Because of the flooding, only hay and pasture plants that can tolerate short periods of wetness should be selected for planting. These plants include fescue and white clover.
• Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.

Woodland
Suitability: Well suited
Trees suitable for planting: Yellow poplar, black walnut, white oak, southern red oak, loblolly pine
Management considerations:
• The main consideration affecting management of timber is the hazard of soil rutting.
• See table 8a for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Poorly suited to most of these uses
Management considerations:
• This soil is poorly suited to most residential and commercial uses because of the flooding.
• Constructing dwellings, commercial structures, roads, and streets above the expected flood level helps to prevent the damage caused by flooding.

BaF—Barfield-Gladdice-Rock outcrop complex, 20 to 70 percent slopes

Composition

Barfield and similar soils: 30 percent
Gladdice soil: 25 percent
Rock outcrop: 20 percent
Minor soils: 25 percent

Setting

Landscape position: Moderately steep and steep hillsides
Size of areas: 10 to 200 acres
Major land use: Woodland

Typical Profile

Barfield
Surface layer:
0 to 4 inches; very dark grayish brown silty clay
Subsoil:
4 to 11 inches; dark brown clay with brownish mottles
11 to 18 inches; brown clay with brownish mottles
18 inches; hard limestone bedrock

Gladdice
Surface layer:
0 to 6 inches; brown silty clay loam
Subsoil:
6 to 13 inches; dark yellowish brown silty clay loam
13 to 18 inches; dark yellowish brown clay
18 to 27 inches; yellowish brown clay with brownish mottles
Substratum:
27 to 30 inches; light olive brown clay with brownish and yellowish mottles
30 inches; hard limestone bedrock

Rock outcrop
The Rock outcrop occurs as horizontal ledges of limestone in scattered areas throughout the unit. In some areas large limestone boulders are on the lower slopes.

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderately slow
Flooding: None
Available water capacity: Barfield—low; Gladdice—moderate
Seasonal high water table: None
Soil reaction: Slightly acid or neutral
Depth to bedrock: Barfield—within 20 inches; Gladdice—20 to 40 inches

Inclusions

• Soils that are less than 8 inches deep over hard bedrock
• Intermingled areas of well drained Dellrose and Mimosa soils on hillsides

Use and Management

Cropland
Suitability: Unsuited
Management considerations:
• The slope, the depth to bedrock, and the rockiness are severe limitations affecting management and production.
• Other areas should be considered.
Capability subclass: 7s

Pasture and Hay
Suitability: Unsuited
Management considerations:
• The slope, the rockiness, and the droughtiness are severe limitations affecting management and production.
• Other areas should be considered.

Woodland
Suitability: Poorly suited
Trees suitable for planting: Virginia pine, eastern redcedar, chestnut oak, white oak

Management considerations:
• The main considerations in managing for timber are the limitations affecting the construction of haul roads and log landings, the suitability for log landings, the hazard of soil rutting, the hazard of off-road erosion, the hazard of erosion on roads and trails, the suitability for roads, the suitability for mechanical planting, the suitability for harvesting equipment, and the suitability for surface and deep mechanical site preparation.
• See tables 8a, 8b, 8c, 8d, and 8e for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Unsuited
Management considerations:
• The major limitations are the slope, the shallow depth to bedrock, and a high shrink-swell potential.
• Other sites should be considered.

BcD—Barfield-Rock outcrop complex, 5 to 20 percent slopes

Composition

Barfield and similar soils: 45 percent
Rock outcrop: 40 percent
Minor soils: 15 percent

Setting

Landscape position: Rolling ridgetops
Size of areas: 5 to 25 acres
Major land use: Woodland

Typical Profile

Barfield
Surface layer:
0 to 4 inches; very dark grayish brown silty clay
Subsoil:
4 to 11 inches; dark brown clay with brownish mottles
11 to 18 inches; brown clay with brownish mottles
18 inches; hard limestone bedrock

Rock outcrop
The Rock outcrop occurs as horizontal ledges of limestone in scattered areas throughout the unit.

Soil Properties and Qualities

Barfield
Drainage class: Well drained
Permeability: Moderately slow
Flooding: None
Available water capacity: Low
Seasonal high water table: None
Soil reaction: Slightly acid or neutral
Depth to bedrock: Within 20 inches

Inclusions

• Soils that are less than 8 inches deep over hard bedrock

Use and Management

Cropland
Suitability: Unsuited
Management considerations:
• The slope, the depth to bedrock, and the rockiness are severe limitations affecting management and production.
• Other areas should be considered.
Capability subclass: 6s

Pasture and Hay
Suitability: Poorly suited
Management considerations:
• The slope, the rockiness, and the droughtiness are severe limitations affecting management and production (fig. 4).
• Other areas should be considered.

Woodland
Suitability: Poorly suited
Trees suitable for planting: Virginia pine, eastern redcedar, chestnut oak, white oak
Management considerations:
• The main considerations in managing for timber are the limitations affecting the construction of haul roads and log landings, the suitability for log landings, the hazard of soil rutting, the hazard of erosion on roads and trails, the suitability for roads, and the suitability for deep mechanical site preparation.
• See tables 8a, 8b, and 8d for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Unsuited
Management considerations:
• The major limitations are the depth to bedrock and a shrink-swell potential.
• Other sites should be considered.

BeB2—Bewleyville silt loam, 2 to 5 percent slopes, eroded

Setting

Landscape position: Broad, undulating ridges
Shape of areas: Irregular
Size of areas: 5 to 35 acres
Major land use: Cropland or hay

Figure 4.—An area of Barfield-Rock outcrop complex, 5 to 20 percent slopes, used as pasture. The limestone rock outcrop hinders the use of this map unit for hay in most areas.

Typical Profile

Surface layer:
0 to 6 inches; yellowish brown silt loam with brownish and reddish mottles
Subsoil:
6 to 26 inches; strong brown silty clay loam with reddish mottles
26 to 45 inches; red clay with brownish mottles
45 to 80 inches; red clay with brownish and grayish mottles

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Soil reaction: Strongly acid or moderately acid, except where lime has been added
Flooding: None
Seasonal high water table: None
Depth to bedrock: More than 5 feet

Inclusions

- Small areas of moderately well drained Dickson soils in saddles and slight depressions
- Christian and Sengtown soils in sloping areas adjacent to the steeper side slopes

Use and Management

Cropland
Suitability: Well suited

Management considerations:
• Most locally adapted crops can be grown and can produce good yields.
• Applying a conservation tillage system helps to prevent the damage caused by erosion.
• No-till planting, contour farming, and stripcropping help to control erosion and maintain productivity.
Capability subclass: 2e

Pasture and Hay
Suitability: Well suited
Management considerations:
• No significant limitations affect forage production if erosion is controlled.
• Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.
• Alfalfa grows well and produces good yields in areas where lime and fertilizer applications are adequate and other necessary management practices have been applied.

Woodland
Suitability: Well suited
Trees suitable for planting: Yellow poplar, white oak, southern red oak, hickory, loblolly pine, shortleaf pine
Management considerations:
• The main consideration affecting management of timber is the hazard of soil rutting.
• See table 8a for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Suited
Management considerations:
• Low strength is the major limitation on sites for local roads and streets.
• Adding coarser textured base material helps to prevent the damage to local roads and streets caused by low strength.

BeC2—Bewleyville silt loam, 5 to 12 percent slopes, eroded

Setting

Landscape position: Broad, undulating or rolling ridges
Shape of areas: Irregular
Size of areas: 5 to 35 acres
Major land use: Cropland or hay

Typical Profile

Surface layer:
0 to 6 inches; yellowish brown silt loam with brownish and reddish mottles
Subsoil:
6 to 26 inches; strong brown silty clay loam with reddish mottles
26 to 45 inches; red clay with brownish mottles
45 to 80 inches; red clay with brownish and grayish mottles

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Soil reaction: Strongly acid or moderately acid, except where lime has been added
Flooding: None
Seasonal high water table: None
Depth to bedrock: More than 5 feet

Inclusions

• Small areas of moderately well drained Dickson soils in saddles and slight depressions
• Christian and Sengtown soils in sloping areas adjacent to the steeper side slopes

Use and Management

Cropland
Suitability: Suited
Management considerations:
• This soil is susceptible to additional erosion, which can result in removal of valuable topsoil and a decrease in rooting depth.
• Conservation measures, such as no-till planting and contour stripcropping, help to control erosion and reduce the runoff rate.
• Tilth can be improved or maintained by applying a cropping sequence that includes grasses, legumes, or a mixture of grasses and legumes; using proper crop rotations; minimizing tillage; and planting cover crops.
Capability subclass: 3e

Pasture and Hay
Suitability: Well suited
Management considerations:
• Because of the slope, additional erosion is a hazard if plants are overgrazed or if the plant stand is in poor condition.
• Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.
• Alfalfa grows well and produces good yields in areas where lime and fertilizer applications are adequate and other necessary management practices have been applied.

Woodland
Suitability: Well suited

Trees suitable for planting: Yellow poplar, white oak, southern red oak, hickory, loblolly pine, shortleaf pine
Management considerations:
• The main considerations affecting management of timber are the hazard of soil rutting and the hazard of erosion on roads and trails.
• See tables 8a and 8b for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Suited
Management considerations:
• The slope is the major limitation on sites for small commercial buildings.
• Low strength is the major limitation on sites for local roads and streets.
• Construction costs and proper design are major considerations if sites for dwellings and small commercial buildings are excavated or filled.
• Building roads and streets in the less sloping areas reduces the amount of cut and fill needed.
• Adding coarser textured base material helps to prevent the damage to local roads and streets caused by low strength.

CrB2—Christian silt loam, 2 to 5 percent slopes, eroded

Setting

Landscape position: Broad, undulating ridgetops, dominantly in the eastern and southeastern parts of the county
Shape of areas: Irregular
Size of areas: 20 to 100 acres
Major land use: Hay, pasture, or woodland

Typical Profile

Surface layer:
0 to 7 inches; yellowish brown silt loam with brownish mottles
Subsoil:
7 to 17 inches; yellowish red silty clay loam
17 to 42 inches; yellowish red silty clay with reddish, brownish, and yellowish mottles
42 to 55 inches; red silty clay with yellowish, brownish, and reddish mottles
55 to 61 inches; yellow, yellowish red, and red silty clay
Substratum:
61 to 80 inches; red, strong brown, and reddish yellow silty clay

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Slow
Available water capacity: Moderate
Soil reaction: Strongly acid or very strongly acid, except where lime has been added
Flooding: None
Seasonal high water table: None
Depth to bedrock: More than 5 feet; isolated boulders within a depth of 60 inches in some areas

Inclusions

• Small areas of severely eroded soils that have a surface layer of silty clay loam
• Moderately well drained Dickson soils in saddles and at the head of drainageways
• Small, intermingled areas of Mountview soils on convex knolls
• Small areas of Hawthorne soils on shoulder slopes, in the eastern part of the county
• Soils that have more gravel in the surface layer and subsoil than the Christian soil

Use and Management

Cropland
Suitability: Well suited
Management considerations:
• Accelerated erosion can remove valuable topsoil and adversely affect rooting depth.
• Conservation measures, such as no-till planting and contour stripcropping, help to control erosion and reduce the runoff rate.
• Tilth can be improved or maintained and soil moisture can be conserved by applying a cropping sequence that includes grasses, legumes, or a mixture of grasses and legumes; using proper crop rotations; minimizing tillage; and planting cover crops.
Capability subclass: 2e

Pasture and Hay
Suitability: Well suited
Management considerations:
• Because of the slope, the hazard of erosion is increased if plants are overgrazed or if the stand is in poor condition.
• Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.
• Alfalfa grows well and produces good yields in areas where lime and fertilizer applications are adequate and other necessary management practices have been applied.

Woodland
Suitability: Well suited
Trees suitable for planting: Eastern white pine, yellow poplar, black walnut, white oak, hickory, white ash, southern red oak
Management considerations:
• The main consideration affecting management of timber is the hazard of soil rutting.
• See table 8a for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Suited
Management considerations:
• A shrink-swell potential is a limitation on sites for dwellings and small commercial buildings.
• Low strength is a limitation on sites for local roads and streets.
• The restricted permeability in the subsoil is a limitation on sites for septic tank absorption fields.
• Backfilling deep cuts with material that has low shrink-swell potential and diverting runoff away from buildings help to prevent structural damage to dwellings.
• Adding coarser textured base material helps to prevent the damage to local roads and streets caused by low strength.
• Increasing the size of septic tank absorption fields and placing filter lines on the contour help to overcome the restricted permeability and the slope.

CrC2—Christian silt loam, 5 to 12 percent slopes, eroded

Setting

Landscape position: Rolling ridgetops, dominantly in the eastern and southeastern parts of the county
Shape of areas: Irregular
Size of areas: 20 to 100 acres
Major land use: Hay, pasture, or woodland

Typical Profile

Surface layer:
0 to 7 inches; yellowish brown silt loam with brownish mottles
Subsoil:
7 to 17 inches; yellowish red silty clay loam
17 to 42 inches; yellowish red silty clay with reddish, brownish, and yellowish mottles
42 to 55 inches; red silty clay with yellowish, brownish, and reddish mottles
55 to 61 inches; yellow, yellowish red, and red silty clay
Substratum:
61 to 80 inches; red, strong brown, and reddish yellow silty clay

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Slow
Available water capacity: Moderate
Soil reaction: Strongly acid or very strongly acid, except where lime has been added
Flooding: None
Seasonal high water table: None
Depth to bedrock: More than 5 feet; isolated boulders within a depth of 60 inches in some areas

Inclusions

• Small areas of severely eroded soils that have a surface layer of silty clay loam
• Moderately well drained Dickson soils on saddles and at the head of drainageways
• Small, intermingled areas of Mountview soils on convex knolls
• Small areas of Hawthorne soils on shoulder slopes, in the eastern part of the county
• Soils that have more gravel in the surface layer and subsoil than the Christian soil

Use and Management

Cropland
Suitability: Suited
Management considerations:
• Accelerated erosion can remove valuable topsoil and adversely affect rooting depth.
• In dry years the soil may be droughty and yields may be reduced.
• Conservation measures, such as no-till planting and contour stripcropping, help to control erosion and reduce the runoff rate.
• Tilth can be improved or maintained and soil moisture can be conserved by applying a cropping sequence that includes grasses, legumes, or a mixture of grasses and legumes; using proper crop rotations; minimizing tillage; and planting cover crops.
Capability subclass: 3e

Pasture and Hay
Suitability: Well suited
Management considerations:
• Because of the slope, additional erosion is a hazard if plants are overgrazed or if the plant stand is in poor condition.
• Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.

• Alfalfa grows well and produces good yields in areas where lime and fertilizer applications are adequate and other necessary management practices have been applied.

Woodland
Suitability: Well suited
Trees suitable for planting: Eastern white pine, yellow poplar, black walnut, white oak, hickory, white ash, southern red oak
Management considerations:
• The main considerations in managing for timber are the hazard of soil rutting and the hazard of erosion on roads and trails.
• See tables 8a and 8b for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Suited
Management considerations:
• The slope and a shrink-swell potential are limitations on sites for dwellings and small commercial buildings.
• Low strength is the major limitation on sites for local roads and streets.
• The restricted permeability in the subsoil and the slope are limitations on sites for septic tank absorption fields.
• Construction costs and proper design are major considerations if sites for dwellings and small commercial buildings are excavated or filled.
• Backfilling deep cuts with material that has low shrink-swell potential and diverting runoff away from buildings help to prevent structural damage to dwellings.
• Adding coarser textured base material helps to prevent the damage to local roads and streets caused by low strength.
• Increasing the size of septic tank absorption fields and placing filter lines on the contour help to overcome the restricted permeability and the slope.

CrD2—Christian silt loam, 12 to 20 percent slopes, eroded

Setting

Landscape position: Hillsides, in the eastern and southeastern parts of the county
Shape of areas: Irregular
Size of areas: 20 to 100 acres
Major land use: Pasture or woodland

Typical Profile

Surface layer:
0 to 7 inches; yellowish brown silt loam with brownish mottles
Subsoil:
7 to 17 inches; yellowish red silty clay loam
17 to 42 inches; yellowish red silty clay with reddish, brownish, and yellowish mottles
42 to 55 inches; red silty clay with yellowish, brownish, and reddish mottles
55 to 61 inches; yellow, yellowish red, and red silty clay
Substratum:
61 to 80 inches; red, strong brown, and reddish yellow silty clay

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Slow
Available water capacity: Moderate
Soil reaction: Strongly acid or very strongly acid, except where lime has been added
Flooding: None
Seasonal high water table: None
Depth to bedrock: More than 5 feet; isolated boulders within a depth of 60 inches in some areas

Inclusions

• Small areas of severely eroded soils that have a surface layer of silty clay loam
• Small areas of somewhat excessively drained Hawthorne soils in the lower positions on hillsides, in the eastern part of the county
• Small areas of Dellrose soils on the lower footslopes

Use and Management

Cropland
Suitability: Poorly suited
Management considerations:
• This soil should not be used continuously as cropland because of the slope and the high erosion potential.
Capability subclass: 6e

Pasture and Hay
Suitability: Suited
Management considerations:
• Because of the slope, the hazard of erosion is increased if plants are overgrazed or if the stand is in poor condition.
• Pastures should be renovated when the amount of better forage plants in stands has decreased to less than needed for optimum production.
• Adjusting stocking rates, especially in areas on the steeper slopes, helps to prevent overgrazing and control erosion.

• Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.

Woodland
Suitability: Suited
Trees suitable for planting: Eastern white pine, yellow poplar, black walnut, white oak, hickory, white ash, southern red oak
Management considerations:
• The main considerations in managing for timber are the suitability for log landings, the hazard of soil rutting, the hazard of erosion on roads and trails, the suitability for roads, and the suitability for mechanical planting.
• See tables 8a, 8b, 8c, and 8d for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Poorly suited
Management considerations:
• The slope and a shrink-swell potential are major limitations on sites for dwellings and small commercial buildings.
• Low strength and the slope are major limitations on sites for roads and streets.
• The restricted permeability in the subsoil and the slope are limitations on sites for septic tank absorption fields.
• Construction costs and proper design are major considerations if sites for dwellings and small commercial buildings are excavated or filled.
• Backfilling deep cuts with material that has low shrink-swell potential and diverting runoff away from buildings help to prevent structural damage to dwellings.
• Building roads and streets in the less sloping areas reduces the amount of cut and fill needed.
• Adding coarser textured base material helps to prevent the damage to local roads and streets caused by low strength.
• Increasing the size of septic tank absorption fields and placing filter lines on the contour help to overcome the restricted permeability and the slope.

DaF—Dellrose and Mimosa soils, 20 to 60 percent slopes

Composition

Dellrose and similar soils: 55 percent
Mimosa soil: 35 percent
Minor soils: 10 percent

Setting

Landscape position: Steep hillsides, north of the Cumberland River
Size of areas: 20 to 100 acres
Major land use: Woodland or, in some areas, pasture

Typical Profile

Dellrose
Surface layer:
0 to 6 inches; dark brown gravelly silt loam
Subsurface layer:
6 to 15 inches; brown gravelly silt loam
Subsoil:
15 to 52 inches; dark yellowish brown gravelly silty clay loam
52 to 63 inches; dark yellowish brown very gravelly silty clay loam with brownish mottles
63 to 80 inches; dark yellowish brown silty clay with brownish mottles

Mimosa
Surface layer:
0 to 5 inches; dark brown silty clay loam
Subsurface layer:
5 to 9 inches; brown silty clay loam with brownish mottles
Subsoil:
9 to 31 inches; yellowish brown clay
31 to 42 inches; yellowish brown clay with brownish mottles
42 inches; hard limestone bedrock

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Dellrose—moderately rapid; Mimosa—slow or very slow
Flooding: None
Available water capacity: Moderate
Seasonal high water table: None
Soil reaction: Very strongly acid to moderately acid
Depth to bedrock: Dellrose—more than 60 inches; Mimosa—40 to 60 inches

Inclusions

• A few small areas of Gladdice soils on the lower third of hillsides
• Intermingled areas of somewhat excessively drained Hawthorne soils on the upper third of hillsides

Use and Management

Cropland
Suitability: Unsuited

Management considerations:
• The slope, the depth to bedrock, the hazard of erosion, the limited available water capacity, and the fragments in the surface soil and subsoil are limitations affecting management and production.
• Other areas should be considered.
Capability subclass: 7e

Pasture and Hay
Suitability: Hay—poorly suited; pasture—suited in some of the less sloping areas
Management considerations:
• The slopes and the hazard of erosion are limitations affecting pasture management.
• Maintaining a permanent vegetative cover helps to control erosion.
• The limited available water capacity can cause a moisture deficit in late summer, and as a result, stands of less hardy plants may suffer from moisture stress.
• Mixtures of hardy forage plants, such as tall fescue with clover or sericea lespedeza, are among the adapted forage plants.
• Reseeding pastures may be necessary if the plant cover does not provide an adequate stand of desirable species for forage production or does not help to control erosion.
• Adjusting stocking rates, especially in areas on the steeper slopes, helps to prevent overgrazing and control erosion.
• The safe operation of equipment used to broadcast seed or apply fertilizer and herbicides may not be possible in pastured areas that have slopes of more than 30 percent unless access roads are built on the contour.

Woodland
Suitability: Poorly suited
Trees suitable for planting: Virginia pine, eastern redcedar, chestnut oak, white oak
Management considerations:
• The main considerations in managing for timber are the limitations affecting the construction of haul roads and log landings, the suitability for log landings, the hazard of soil rutting, the hazard of erosion on roads and trails, the suitability for roads, the suitability for mechanical planting, the suitability for use of harvest equipment, and the suitability for mechanical site preparation.
• See tables 8a, 8b, 8c, and 8d for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Unsuited
Management considerations:
• The slope, the shallow depth to bedrock, a high shrink-swell potential, and the restricted permeability are major limitations.
• Other sites should be considered

DeC—Dellrose gravelly silt loam, 5 to 12 percent slopes

Setting

Landscape position: Concave footslopes, north of the Cumberland River
Shape of areas: Long and narrow
Size of areas: 5 to 40 acres
Major land use: Pasture or row crops

Typical Profile

Surface layer:
0 to 6 inches; dark brown gravelly silt loam
Subsurface layer:
6 to 15 inches; brown gravelly silt loam
Subsoil:
15 to 52 inches; dark yellowish brown gravelly silty clay loam
52 to 63 inches; dark yellowish brown very gravelly silty clay loam with brownish mottles
63 to 80 inches; dark yellowish brown silty clay with brownish mottles

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderately rapid
Available water capacity: Moderate
Soil reaction: Very strongly acid to moderately acid, except where lime has been added
Flooding: None
Seasonal high water table: None
Depth to bedrock: More than 5 feet

Inclusions

• Small areas of Armour and Sykes soils on stream terraces
• Mimosa soils at the base of footslopes
• Narrow strips of well drained Arrington soils in the lower landscape positions adjacent to stream channels

Use and Management

Cropland
Suitability: Suited
Management considerations:
• Accelerated erosion can remove valuable topsoil and adversely affect rooting depth.

• Conservation measures, such as no-till planting and contour stripcropping, help to control erosion and reduce the runoff rate.
• Tilth can be improved or maintained by applying a cropping sequence that includes grasses, legumes, or a mixture of grasses and legumes; using proper crop rotations; minimizing tillage; and planting cover crops.
Capability subclass: 3e

Pasture and Hay
Suitability: Well suited
Management considerations:
• Because of the slope, erosion is a hazard if plants are overgrazed or if the plant stand is in poor condition.
• Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.
• Alfalfa grows well and produces good yields in areas where lime and fertilizer applications are adequate and other necessary management practices have been applied.

Woodland
Suitability: Well suited
Trees suitable for planting: Yellow poplar, black walnut, white oak, southern red oak, hickory, eastern white pine, loblolly pine
Management considerations:
• The main considerations for management of timber are the hazard of soil rutting and the hazard of erosion on roads and trails.
• See tables 8a and 8b for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Suited
Management considerations:
• The slope is a limitation on sites for local roads and streets.
• The slope and the restricted permeability in the lower part of the subsoil are limitations on sites for septic tank absorption fields.
• The slope is a limitation on sites for dwellings and small commercial buildings.
• Building local roads and streets on the contour and in the less sloping areas reduces the amount of cut and fill needed.
• Increasing the size of septic tank absorption fields and installing distribution lines on the contour will help to compensate for the slope and the restricted permeability.
• Construction costs and proper design are major considerations if sites for dwellings and small commercial buildings are excavated or filled.

DeD2—Dellrose gravelly silt loam, 12 to 20 percent slopes, eroded

Setting

Landscape position: Hillsides, north of the Cumberland River
Shape of areas: Long and narrow
Size of areas: 5 to 40 acres
Major land use: Pasture or woodland

Typical Profile

Surface layer:
0 to 4 inches; dark brown gravelly silt loam with brownish mottles
Subsoil:
4 to 52 inches; dark yellowish brown gravelly silty clay loam
52 to 63 inches; dark yellowish brown very gravelly silty clay loam with brownish mottles
63 to 80 inches; dark yellowish brown silty clay with brownish mottles

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderately rapid
Available water capacity: Moderate
Soil reaction: Very strongly acid to moderately acid, except where lime has been added
Flooding: None
Seasonal high water table: None
Depth to bedrock: More than 5 feet

Inclusions

• Small areas of Armour and Sykes soils on stream terraces.
• Mimosa soils on footslopes
• Intermingled areas of Barfield and Gladdice soils in steep, convex positions on the landscape

Use and Management

Cropland
Suitability: Poorly suited
Management considerations:
• This soil should not be used continuously as cropland because of the slope and the high erosion potential.
• Contour farming and a crop rotation system in which a vegetative cover is maintained for several seasons following cultivation help to control erosion.
• Conservation measures, such as no-till planting and contour stripcropping, help to control erosion and reduce the runoff rate.
Capability subclass: 4e

Pasture and Hay
Suitability: Suited (fig. 5)
Management considerations:
• Because of the slope, additional erosion is a hazard if plants are overgrazed or if the plant stand is in poor condition.
• Pastures should be renovated when the amount of better forage plants in stands has decreased to less than needed for optimum production.
• Adjusting stocking rates, especially in areas on the steeper slopes, helps to prevent overgrazing and control erosion.
• Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.

Woodland
Suitability: Suited
Trees suitable for planting: Yellow poplar, black walnut, white oak, southern red oak, hickory, eastern white pine, loblolly pine
Management considerations:
• The main considerations in managing for timber are the suitability for log landings, the hazard of soil

Figure 5.—An area of Dellrose gravelly silt loam, 12 to 20 percent slopes, eroded. In the background on the steep, wooded hillsides is an area of Hawthorne gravelly silt loam, 20 to 70 percent slopes.

rutting, the hazard of erosion on roads and trails, the suitability for roads, and the suitability for mechanical planting.
• See tables 8a, 8b, and 8c for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Poorly suited
Management considerations:
• The slope is the major limitation affecting most residential and commercial uses.

DeE—Dellrose gravelly silt loam, 20 to 45 percent slopes

Setting

Landscape position: Steep hillsides, north of the Cumberland River
Size of areas: 5 to 40 acres
Major land use: Woodland or, in some areas, pasture

Typical Profile

Surface layer:
0 to 6 inches; dark brown gravelly silt loam
Subsurface layer:
6 to 15 inches; brown gravelly silt loam
Subsoil:
15 to 52 inches; dark yellowish brown gravelly silty clay loam
52 to 63 inches; dark yellowish brown very gravelly silty clay loam with brownish mottles
63 to 80 inches; dark yellowish brown silty clay with brownish mottles

Inclusions

• A few small, intermingled areas of Gladdice and Mimosa soils in the lower landscape positions
• Hawthorne soils on the upper third of hillsides

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderately rapid
Available water capacity: Moderate
Soil reaction: Very strongly acid to moderately acid, except where lime has been added
Flooding: None
Seasonal high water table: None
Depth to bedrock: More than 5 feet

Use and Management

Cropland
Suitability: Unsuited
Management considerations:
• The slope, the hazard of erosion, the limited available water capacity, and the fragments in the surface soil and subsoil are limitations affecting management and production.
• Other areas should be considered.
Capability subclass: 7e

Pasture and Hay
Suitability: Hay—poorly suited, pasture—suited in some of the less sloping areas
Management considerations:
• The slope, the high runoff rate, and the hazard of erosion are limitations affecting pasture management.
• A permanent vegetative cover helps to control erosion.
• The high runoff rate and the limited available water capacity can cause a moisture deficit in late summer, and as a result, stands of less hardy plants may suffer from moisture stress.
• Mixtures of hardy forage plants, such as tall fescue with clover or sericea lespedeza, are among the adapted forage plants.
• Reseeding pastures may be necessary if the plant cover does not provide an adequate stand of desirable species for forage production or does not help to control erosion.
• Adjusting stocking rates, especially in areas on the steeper slopes, helps to prevent overgrazing and control erosion.
• The safe operation of equipment used to broadcast seed or apply fertilizer and herbicides may not be possible in pastured areas that have slopes of more than 30 percent unless access roads are built on the contour.

Woodland
Suitability: Poorly suited
Trees suitable for planting: Virginia pine, eastern redcedar, chestnut oak, white oak
Management considerations:
• The main considerations in managing for timber are the limitations affecting the construction of haul roads and log landings, the suitability for log landings, the hazard of soil rutting, the hazard of erosion on roads and trails, the suitability for roads, and the suitability for mechanical planting.
• See tables 8a, 8b, and 8c for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Unsuited
Management considerations:
• The slope is the major limitation.
• Other sites should be considered.

DkB2—Dickson silt loam, 2 to 5 percent slopes, eroded

Setting

Landscape position: Broad, undulating ridgetops
Shape of areas: Irregular
Size of areas: 5 to 40 acres
Major land use: Cropland or hay

Typical Profile

Surface layer:
0 to 11 inches; yellowish brown silt loam with olive brown mottles
Subsoil:
11 to 22 inches; light olive brown silty clay loam with brownish mottles
22 to 25 inches; light yellowish brown silty clay loam and light olive brown silt loam
25 to 51 inches; a fragipan of yellowish brown silty clay loam with brownish and grayish mottles
51 to 66 inches; red gravelly clay

Inclusions

- A few small areas of a poorly drained soil in depressions
- Well drained Mountview soils on the slightly higher, convex knolls

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate above the fragipan, slow or very slow in the fragipan
Available water capacity: Moderate
Soil reaction: Strongly acid or very strongly acid, except where lime has been added
Flooding: None
Depth to high water table: 1.5 to 2.0 feet in winter and early spring (perched)
Depth to bedrock: More than 5 feet

Use and Management

Cropland
Suitability: Well suited
Management considerations:
- Most climatically adapted crops grow well if management measures are applied to help control erosion.
- The wetness in winter and early spring can restrict rooting depth and plant germination.
- Cover crops, crop rotations, crop residue management, and a conservation tillage system help to control erosion and conserve soil moisture.
- Planting crops later in the spring will improve plant germination and early growth.

Capability subclass: 2e

Pasture and Hay
Suitability: Well suited
Management considerations:
- Because of the seasonal wetness, only hay and pasture plants that can tolerate short periods of wetness should be selected for planting. These plants include fescue and white clover.
- The perched water table limits grazing for several days at a time in winter and early spring.
- Hay yields may be reduced in dry years because of the limited available water capacity.
- Grazing should be deferred until late spring and then discontinued in early fall.
- Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.

Woodland
Suitability: Well suited
Trees suitable for planting: White oak, southern red oak, yellow poplar, eastern white pine, loblolly pine
Management considerations:
- The main considerations for managing timber are the hazard of soil rutting and the suitability for mechanical site preparation.
- See tables 8a and 8d for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Poorly suited
Management considerations:
- The perched water table and the restricted permeability in the subsoil are major limitations on sites for septic tank absorption fields.
- Low strength is the major limitation on sites for local roads and streets.
- The seasonal wetness is a limitation on sites for dwellings with basements and small commercial buildings.
- A subsurface drainage system helps to lower the water table on sites for septic tank absorption fields.
- Adding coarser textured base material helps to prevent the damage to local roads and streets caused by low strength.
- Installing a drainage system around dwellings and small commercial buildings helps to overcome the wetness.

DkC2—Dickson silt loam, 5 to 8 percent slopes, eroded

Setting

Landscape position: Undulating ridges
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major land use: Hay or pasture

Typical Profile

Surface layer:
0 to 11 inches; yellowish brown silt loam with olive brown mottles
Subsoil:
11 to 22 inches; light olive brown silty clay loam with brownish mottles
22 to 25 inches; light yellowish brown silty clay loam and light olive brown silt loam
25 to 51 inches; a fragipan of yellowish brown silty clay loam with brownish and grayish redox features
51 to 66 inches; red gravelly clay

Inclusions

- A few small areas of a poorly drained soil in depressions
- Well drained Mountview soils on the slightly higher, convex knolls

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate above the fragipan, slow or very slow in the fragipan
Available water capacity: Moderate
Soil reaction: Strongly acid or very strongly acid, except where lime has been added
Flooding: None
Depth to water table: 1.5 to 2.0 feet in winter and early spring (perched)
Depth to bedrock: More than 5 feet

Use and Management

Cropland
Suitability: Suited
Management considerations:
- Accelerated erosion can remove valuable topsoil and adversely affect rooting depth.
- Conservation measures, such as no-till planting and contour stripcropping, help to control erosion and reduce the runoff rate.
- The wetness in winter and early spring can restrict rooting depth and plant germination.
- Planting crops later in the spring will improve plant germination and early growth.

Capability subclass: 3e

Pasture and Hay
Suitability: Well suited
Management considerations:
- Because of the seasonal wetness, only hay and pasture plants that can tolerate short periods of wetness should be selected for planting. These plants include fescue and white clover.
- The perched water table limits grazing for several days at a time in winter and early spring.
- Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.
- Grazing should be deferred until late spring and then discontinued in early fall.

Woodland
Suitability: Well suited
Trees suitable for planting: White oak, southern red oak, yellow poplar, eastern white pine
Management considerations:
- The main considerations affecting management of timber are the hazard of soil rutting and the suitability for mechanical preparation.
- See tables 8a and 8d for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Poorly suited
Management considerations:
- The perched water table, the slope, and the restricted permeability in the subsoil are major limitations on sites for septic tank absorption fields.
- Low strength and the wetness are limitations on sites for local roads and streets.
- The slope and the wetness are major limitations on sites for small commercial buildings.
- This soil is poorly suited to dwellings with basements because of the wetness.
- A subsurface drainage system helps to lower the water table on sites for septic tank absorption fields.
- If the soil is to be used as a base for roads and streets, designing a drainage system to remove surface water and adding coarser textured base material help to prevent the damage to local roads and streets caused by wetness and low strength.
- Construction costs and proper design are major considerations if sites for small commercial buildings are excavated or filled.
- Providing a drainage system and diverting runoff away from dwellings and small commercial buildings help to overcome the wetness.

HaD—Hawthorne gravelly silt loam, 5 to 20 percent slopes

Setting

Landscape position: Rolling ridgetops, north of the Cumberland River
Shape of areas: Long and irregular
Size of areas: 5 to 200 acres
Major land use: Woodland

Typical Profile

Surface layer:
0 to 2 inches; brown gravelly silt loam
Subsurface layer:
2 to 4 inches; brown gravelly silt loam
Subsoil:
4 to 12 inches; yellowish brown very channery silt loam with brownish and yellowish mottles
12 to 23 inches; brownish yellow very channery silt loam with brownish mottles
Substratum:
23 inches; alternating strata of highly fractured siltstone, chert bands, and silty clay loam soil material

Inclusions

- Well drained Dellrose soils on hillsides
- Small, intermingled areas of well drained Sengtown and Sugargrove soils on convex knolls

Soil Properties and Qualities

Drainage class: Somewhat excessively drained
Permeability: Moderately rapid
Available water capacity: Low
Soil reaction: Strongly acid to extremely acid, except where lime has been added
Flooding: None
Seasonal high water table: None
Depth to soft bedrock: 20 to 40 inches

Use and Management

Cropland
Suitability: Unsuited
Management considerations:
- This soil is unsuited to row crops because of the slope, the low available water capacity, the depth to bedrock, and the fragments in the surface layer and subsoil.
- Other areas should be considered.

Capability subclass: 4s

Pasture and Hay
Suitability: Poorly suited
Management considerations:
- Stands of pasture plants are poor or sparse because of the low available water capacity.
- Because of the slope, the hazard of erosion is increased if plants are overgrazed.
- Forage plants that can tolerate droughty conditions should be selected for seeding.
- Pastures should be renovated when the amount of better forage plants in stands has decreased to less than needed for optimum production.
- Adjusting stocking rates, especially in areas on the steeper slopes, helps to prevent overgrazing.

Woodland
Suitability: Suited to drought-resistant species
Trees suitable for planting: Eastern redcedar, white oak, mockernut hickory, chestnut oak, Virginia pine
Management considerations:
- The main considerations in managing for timber are the suitability for log landings, the hazard of soil rutting, and the suitability for roads.
- See tables 8a and 8b for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Poorly suited
Management considerations:
- This soil is poorly suited to residential and commercial uses because of the slope and the depth to bedrock.
- Other sites should be considered.

HaF—Hawthorne gravelly silt loam, 20 to 70 percent slopes

Setting

Landscape position: Steep, highly dissected hillsides
Size of areas: 20 to 300 acres
Major land use: Woodland

Typical Profile

Surface layer:
0 to 2 inches; brown gravelly silt loam
Subsurface layer:
2 to 4 inches; brown gravelly silt loam
Subsoil:
4 to 12 inches; yellowish brown very channery silt loam with brownish and yellowish mottles
12 to 23 inches; brownish yellow very channery silt loam with brownish mottles
Substratum:
23 inches; alternating strata of highly fractured siltstone, chert bands, and silty clay loam soil material

Inclusions

- Small areas of well drained Mimosa and Barfield soils on the lower part of hillsides
- Some areas of rock outcrop at the surface on the lower part of hillsides

Soil Properties and Qualities

Drainage class: Somewhat excessively drained
Permeability: Moderately rapid
Available water capacity: Low
Soil reaction: Extremely acid to strongly acid
Seasonal high water table: None
Depth to soft bedrock: 20 to 40 inches

Use and Management

Cropland
Suitability: Unsuited
Management considerations:
- The slope, the depth to bedrock, the hazard of erosion, the limited available water capacity, and fragments in the surface layer and subsoil are limitations affecting management and production.
- Other areas should be considered.

Capability subclass: 7s

Pasture and Hay
Suitability: Poorly suited
Management considerations:
- The slope and the hazard of erosion are limitations affecting pasture management.
- The high runoff rate and the limited available water capacity can cause a moisture deficit in late summer, and as a result, stands of less hardy plants may suffer from moisture stress.
- Mixtures of hardy forage plants, such as tall fescue with clover or sericea lespedeza, are among the adapted forage plants.
- Reseeding pastures may be necessary if the plant cover does not provide an adequate stand of desirable species for forage production or does not help to control erosion.
- Adjusting stocking rates, especially in areas on the steeper slopes, helps to prevent overgrazing and control erosion.
- The safe operation of equipment used to broadcast seed or apply fertilizer and herbicides may not be possible in pastured areas that have slopes of more than 30 percent unless access roads are built on the contour.

Woodland
Suitability: Poorly suited
Trees suitable for planting: Eastern redcedar, white oak, mockernut hickory, chestnut oak, Virginia pine
Management considerations:
- The main considerations in managing for timber are the limitations affecting the construction of haul roads and log landings, the suitability for log landings, the hazard of soil rutting, the hazard of off-road erosion, the hazard of erosion on roads and trails, the suitability for roads, the suitability for mechanical planting, the suitability for use of harvesting equipment, and the suitability for mechanical site preparation.
- See tables 8a, 8b, 8c, and 8d for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Unsuited
Management considerations:
- This soil is poorly suited to most of these uses because of the slope, the depth to rock, and the hazards of seepage and slippage.
- Other sites should be considered.

HdF—Hawthorne-Rock outcrop complex, 40 to 80 percent slopes

Composition

Hawthorne and similar soils: 48 percent
Rock outcrop: 47 percent
Minor soils: 5 percent

Setting

Landscape position: Very steep bluffs along the Roaring River, adjacent to Overton County
Size of areas: 75 to 150 acres
Major land use: Woodland or recreational activities

Typical Profile

Surface layer:
0 to 2 inches; brown gravelly silt loam
Subsurface layer:
2 to 4 inches; brown gravelly silt loam
Subsoil:
4 to 12 inches; yellowish brown very channery silt loam with brownish and yellowish mottles
12 to 23 inches; brownish yellow very channery silt loam with brownish mottles
Substratum:
23 inches; alternating strata of highly fractured siltstone, chert bands, and silty clay loam soil material

Inclusions

- Areas of rock rubble on narrow shelves and at the base of the bluffs

• Small, intermingled areas of soils that have hard bedrock within a depth of 40 inches and are on benches

Soil Properties and Qualities

Hawthorne
Drainage class: Somewhat excessively drained
Permeability: Moderately rapid
Available water capacity: Low
Soil reaction: Extremely acid to strongly acid
Seasonal high water table: None
Depth to soft bedrock: 20 to 40 inches

Rock outcrop
The Rock outcrop occurs as large vertical bluffs of hard limestone bedrock stratified with siltstone and soil material. Many areas have vegetation growing horizontally from the seams in the bedrock and large stones and cobbles deposited as talus at the base of the bluffs.

Use and Management

Cropland
Suitability: Unsuited
Management considerations:
• This unit is not suited to cropland because of the very steep slopes and the limestone bluffs.
Capability subclass: 7s

Pasture and Hay
Suitability: Unsuited
Management considerations:
• The unit is unsuited to pasture and hay because of the very steep slopes and the vertical rock bluffs.

Woodland
Suitability: Unsuited
• This unit is unsuited for use as woodland because of the very steep slopes and the nearly vertical rock bluffs.
• See tables 8a, 8b, 8c, and 8d for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Unsuited
• Other sites should be considered.

HoB—Holston loam, 2 to 5 percent slopes

Setting

Landscape position: Undulating stream terraces along the Cumberland River and its major tributaries
Shape of areas: Irregular
Size of areas: 5 to 80 acres
Major land use: Cropland

Typical Profile

Surface layer:
0 to 8 inches; brown loam
Subsoil:
8 to 17 inches; strong brown clay loam
17 to 80 inches; strong brown clay loam with yellowish and brownish mottles

Inclusions

• Intermingled areas of Armour and Sykes soils in the lower positions on stream terraces
• Small areas of moderately well drained Swafford soils in small depressions and on flats on stream terraces
• Mimosa soils along the edge of footslopes

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Soil reaction: Very strongly acid or strongly acid, except where lime has been added
Flooding: None
Seasonal high water table: None
Depth to bedrock: More than 5 feet

Use and Management

Cropland
Suitability: Well suited
Management considerations:
• Most locally adapted crops can be grown and can produce good yields.
• This soil is susceptible to erosion, which can result in removal of valuable topsoil.
• No-till planting, contour farming, and stripcropping help to control erosion and maintain productivity.
Capability subclass: 2e

Pasture and Hay
Suitability: Well suited
Management considerations:
• No significant limitations affect forage production if erosion is controlled.
• Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.
• Alfalfa grows well and produces good yields in areas where lime and fertilizer applications are adequate and other necessary management practices have been applied.

Woodland
Suitability: Well suited

Trees suitable for planting: Yellow poplar, black walnut, white oak, southern red oak, hickory, eastern white pine, loblolly pine
Management considerations:
• The main consideration affecting management of timber is the hazard of soil rutting.
• See table 8a for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Well suited
Management considerations:
• Few limitations affect residential or commercial use.

HoC2—Holston loam, 5 to 12 percent slopes, eroded

Setting

Landscape position: Rolling, old stream terraces along the Cumberland River and its major tributaries
Shape of areas: Irregular
Size of areas: 25 to 75 acres
Major land use: Hay or cropland

Typical Profile

Surface layer:
0 to 4 inches; brown loam
Subsurface layer:
4 to 9 inches; brown clay loam with brownish mottles
Subsoil:
9 to 17 inches; strong brown clay loam
17 to 37 inches; strong brown clay loam with brownish mottles
37 to 80 inches; strong brown clay loam with brownish and yellowish mottles

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Soil reaction: Very strongly acid or strongly acid, except where lime has been added
Flooding: None
Seasonal high water table: None
Depth to bedrock: More than 5 feet

Inclusions

• Intermingled areas of Armour and Sykes soils in the lower positions on stream terraces
• Small areas of moderately well drained Swafford soils in small depressions and on flats on stream terraces
• Mimosa soils along the edge of footslopes

Use and Management

Cropland
Suitability: Suited
Management considerations:
• Accelerated erosion can remove valuable topsoil and adversely affect rooting depth.
• Conservation measures, such as no-till planting and contour stripcropping, help to control erosion and reduce the runoff rate.
• Tilth can be improved or maintained by applying a cropping sequence that includes grasses, legumes, or a mixture of grasses and legumes; using proper crop rotations; minimizing tillage; and planting cover crops.
Capability subclass: 3e

Pasture and Hay
Suitability: Well suited
Management considerations:
• Because of the slope, additional erosion is a hazard if plants are overgrazed or if the plant stand is in poor condition.
• Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.
• Alfalfa grows well and produces good yields in areas where lime and fertilizer applications are adequate and other necessary management practices have been applied.

Woodland
Suitability: Well suited
Trees suitable for planting: Yellow poplar, black walnut, white oak, southern red oak, hickory, eastern white pine, loblolly pine
Management considerations:
• The main considerations for management of timber are the hazard of soil rutting and the hazard of erosion on roads and trails.
• See tables 8a and 8b for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Suited
Management considerations:
• The slope is a limitation on sites for dwellings, small commercial buildings, local roads and streets, and septic tank absorption fields.
• Construction costs and proper design are major considerations if sites for dwellings and small commercial buildings are excavated or filled, and they should be considered during the initial planning process.
• Building local roads and streets on the contour and in the less sloping areas reduces the amount of cut and fill needed.

HoD2—Holston loam, 12 to 20 percent slopes, eroded

Setting

Landscape position: Hilly stream terraces along the Cumberland River and its major tributaries
Shape of areas: Irregular
Size of areas: 25 to 75 acres
Major land use: Pasture or hay

Typical Profile

Surface layer:
0 to 4 inches; brown loam
Subsurface layer:
4 to 9 inches; brown clay loam with brownish mottles
Subsoil:
9 to 17 inches; strong brown clay loam
17 to 37 inches; strong brown clay loam with brownish mottles
37 to 80 inches; strong brown clay loam with brownish and yellowish mottles

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Soil reaction: Very strongly acid or strongly acid, except where lime has been added
Flooding: None
Seasonal high water table: None
Depth to bedrock: More than 5 feet

Inclusions

- Small areas of Mimosa soils along the edge of footslopes
- Intermingled areas of severely eroded soils that have a surface layer of clay loam

Use and Management

Cropland
Suitability: Poorly suited
Management considerations:
- This soil should not be used continuously as cropland because of the slope and the high erosion potential.
- Contour farming and a crop rotation system in which a vegetative cover is maintained for several seasons following cultivation help to control erosion.
- Conservation measures, such as no-till planting and contour stripcropping, help to control erosion and reduce the runoff rate.

Capability subclass: 4e

Pasture and Hay
Suitability: Suited
Management considerations:
- Because of the slope, additional erosion is a hazard if plants are overgrazed or if the plant stand is in poor condition.
- Pastures should be renovated when the amount of better forage plants in stands has decreased to less than needed for optimum production.
- Adjusting stocking rates, especially in areas on the steeper slopes, helps to prevent overgrazing and control erosion.
- Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.

Woodland
Suitability: Suited
Trees suitable for planting: Eastern white pine, yellow poplar, black walnut, white oak, hickory, white ash, southern red oak
Management considerations:
- The main considerations in managing for timber are the suitability for log landings, the hazard of soil rutting, the hazard of erosion on roads and trails, the suitability for roads, and the suitability for mechanical site preparation.
- See tables 8a, 8b, 8c, and 8d for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Poorly suited
Management considerations:
- The slope is a limitation on sites for dwellings, small commercial buildings, local roads and streets, and septic tank absorption fields.
- Construction costs and proper design are major considerations if sites for dwellings and small commercial buildings are excavated or filled, and they should be considered during the planning process.
- Building roads and streets in the less sloping areas reduces the amount of cut and fill needed.
- Adding coarser textured base material helps to prevent the damage to local roads and streets caused by low strength.

HoD3—Holston loam, 12 to 20 percent slopes, severely eroded

Setting

Landscape position: Hilly stream terraces along the Cumberland River and its major tributaries
Shape of areas: Irregular
Size of areas: 5 to 90 acres

Major land use: Pasture or woodland

Typical Profile

Surface layer:
0 to 4 inches; brown loam with brownish mottles
Subsoil:
4 to 27 inches; strong brown clay loam
27 to 45 inches; strong brown clay loam with brownish mottles
45 to 80 inches; strong brown clay loam with brownish and yellowish mottles

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Available water capacity: High or moderate
Soil reaction: Very strongly acid or strongly acid, except where lime has been added
Flooding: None
Seasonal high water table: None
Depth to bedrock: More than 5 feet

Inclusions

- Small areas of Mimosa and Sykes soils along the edge of footslopes
- A few intermingled areas of shallow rills and gullies and soils that have a surface layer of clay loam

Use and Management

Cropland
Suitability: Unsuited
Management considerations:
- This soil is not suited to row crops because of the slope and the high erosion potential.
- Other areas should be considered.

Capability subclass: 6e

Pasture and Hay
Suitability: Suited
Management considerations:
- Because of the slope, additional erosion is a hazard if plants are overgrazed or if the plant stand is in poor condition.
- Pastures should be renovated when the amount of better forage plants in stands has decreased to less than needed for optimum production.
- Adjusting stocking rates, especially in areas on the steeper slopes, helps to prevent overgrazing and control erosion.
- Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.

Woodland
Suitability: Suited
Trees suitable for planting: Eastern white pine, yellow poplar, black walnut, white oak, hickory, white ash, southern red oak
Management considerations:
- The main considerations in managing for timber are the suitability for log landings, the hazard of soil rutting, the hazard of erosion on roads and trails, the suitability for roads, and the suitability for mechanical site preparation.
- See tables 8a, 8b, 8c, and 8d for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Poorly suited
Management considerations:
- The slope is a limitation on sites for dwellings, small commercial buildings, local roads and streets, and septic tank absorption fields.
- Construction costs and proper design are major considerations if sites for dwellings and small commercial buildings are excavated or filled, and they should be considered during the planning process.
- Building roads and streets in the less sloping areas reduces the amount of cut and fill needed.
- Adding coarser textured base material helps to prevent the damage to local roads and streets caused by low strength.

HuB—Humphreys gravelly silt loam, 2 to 5 percent slopes

Setting

Landscape position: Footslopes and stream terraces
Shape of areas: Pear-shaped
Size of areas: 5 to 20 acres
Major land use: Hay, pasture, or woodland

Typical Profile

Surface layer:
0 to 5 inches; dark yellowish brown gravelly silt loam with brownish mottles
Subsoil:
5 to 17 inches; brown gravelly silty clay loam
17 to 55 inches; dark yellowish brown gravelly silty clay loam
Substratum:
55 to 80 inches; yellowish brown very gravelly silty clay loam

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderately rapid
Available water capacity: Moderate

Soil reaction: Very strongly acid to moderately acid, except where lime has been added
Flooding: None
Depth to water table: 5 to 6 feet in winter and early spring
Depth to bedrock: More than 5 feet

Inclusions

- Small areas of moderately well drained Swafford soils on the lower parts of stream terraces
- Small, narrow strips of Arrington and Skidmore soils adjacent to stream channels
- Intermingled areas of Armour and Sykes soils

Use and Management

Cropland
Suitability: Well suited
Management considerations:
- Applying a conservation tillage system helps to prevent damage from erosion.
- Coarse fragments on or near the surface of the soil can hinder tillage and limit the amount of moisture available to plants in dry years.
- No-till planting, contour farming, stripcropping, and growing cover crops help to conserve soil moisture and control erosion.
- Tilth can be maintained or improved by applying a cropping sequence that includes grasses, legumes, or a mixture of grasses and legumes; using proper crop rotations; and returning crop residue to the soil.

Capability subclass: 2e

Pasture and Hay
Suitability: Well suited
Management considerations:
- In dry years the low available water capacity can reduce yields of moisture-sensitive hay crops, such as alfalfa.
- Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.
- Alfalfa grows well and produces good yields when moisture is adequate and necessary management measures, such as the addition of lime and fertilizer, have been applied.

Woodland
Suitability: Well suited
Trees suitable for planting: Yellow poplar, black walnut, white oak, white ash, hickory, sweetgum, loblolly pine
Management considerations:
- The main consideration affecting management of timber is the hazard of soil rutting.
- See table 8a for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Well suited
Management considerations:
- The wetness caused by seepage from the higher areas may be a limitation on sites for dwellings and small commercial buildings if the structures are built on footslopes.
- Installing a subsurface tile drainage system helps to divert water away from sites for septic tank absorption fields and structures.

HuC—Humphreys gravelly silt loam, 5 to 12 percent slopes

Setting

Landscape position: Footslopes and stream terraces
Shape of areas: Long and irregular
Size of areas: 5 to 25 acres
Major land use: Woodland, hay, or pasture

Typical Profile

Surface layer:
0 to 5 inches; dark yellowish brown gravelly silt loam with brownish mottles
Subsoil:
5 to 17 inches; brown gravelly silty clay loam
17 to 55 inches; dark yellowish brown gravelly silty clay loam
Substratum:
55 to 80 inches; yellowish brown very gravelly silty clay loam

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderately rapid
Available water capacity: Moderate
Soil reaction: Very strongly acid to moderately acid, except where lime has been added
Flooding: None
Depth to water table: 5 to 6 feet in winter and early spring
Depth to bedrock: More than 5 feet

Inclusions

- Small, narrow strips of Arrington and Skidmore soils adjacent to stream channels
- Intermingled areas of Armour and Sykes soils

Use and Management

Cropland
Suitability: Suited

Management considerations:
• Accelerated erosion can remove valuable topsoil and adversely affect rooting depth.
• Coarse fragments on or near the surface of the soil can hinder tillage and limit the amount of moisture available to plants in dry years (fig. 6).
• No-till planting, contour farming, stripcropping, and growing cover crops help to conserve soil moisture and control erosion.
• Tilth can be improved or maintained by applying a cropping sequence that includes grasses, legumes, or a mixture of grasses and legumes; using proper crop rotations; and returning crop residue to the soil.
Capability subclass: 3e

Pasture and Hay
Suitability: Well suited
Management considerations:
• Because of the slope, additional erosion is a hazard if plants are overgrazed or if the plant stand is in poor condition.

Figure 6.—Tobacco growing in an area of Humphreys gravelly silt loam, 5 to 12 percent slopes. The coarse fragments on and near the surface of the soil following cultivation can hinder tobacco operations and growth of the crop.

• In dry years the low available water capacity can reduce yields of moisture-sensitive hay crops, such as alfalfa.
• Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.
• Alfalfa grows well and produces good yields when moisture is adequate and necessary management measures, such as the addition of lime and fertilizer, have been applied.

Woodland
Suitability: Well suited
Trees suitable for planting: Yellow poplar, black walnut, white oak, white ash, hickory, sweetgum, loblolly pine
Management considerations:
• The main considerations for managing timber are the hazard of soil rutting and the hazard of erosion on roads and trails.
• See tables 8a and 8b for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Suited
Management considerations:
• The slope is the major limitation on sites for small commercial buildings.
• The slope and the seasonal wetness caused by seepage from higher areas are limitations on sites for septic tank absorption fields, dwellings, and commercial buildings if the sites are on footslopes.
• The slope is a management concern on sites for local roads and streets.
• Construction costs and proper design are major considerations if sites for dwellings and small commercial buildings are excavated or filled.
• Installing a subsurface tile drainage system helps to divert water away from sites for septic tank absorption fields and structures.
• Building roads and streets in the less sloping areas reduces the amount of cut and fill needed.

Ld—Lindside silt loam, occasionally flooded

Setting

Landscape position: Flood plains
Shape of areas: Long and narrow
Size of areas: 5 to 50 acres
Slope: 0 to 3 percent
Major land use: Cropland

Typical Profile

Surface layer:
0 to 12 inches; brown silt loam
Subsoil:
12 to 26 inches; dark yellowish brown silty clay loam with brownish and grayish mottles
26 to 39 inches; brown silty clay loam with brownish and grayish mottles
39 to 65 inches; dark yellowish brown silty clay loam with brownish and grayish mottles

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate
Available water capacity: High
Soil reaction: Slightly acid or neutral
Flooding: Occasional; very brief periods in winter and early spring
High water table: Within 1.6 to 2.5 feet of the surface in winter and early spring
Depth to bedrock: More than 5 feet

Inclusions

• Small areas of Skidmore and Staser soils along natural stream levees
• Poorly drained Minter soils in depressions and in narrow strips adjacent to steep upland side slopes
• Armour soils on low stream terraces

Use and Management

Cropland
Suitability: Well suited
Management considerations:
• Most locally adapted crops can be grown and can produce good yields.
• Small grain crops produce good yields, but they can be damaged by the occasional flooding.
• The flooding, which occurs in winter and early spring, is not a limitation affecting management.
Capability subclass: 2w

Pasture and Hay
Suitability: Well suited
Management considerations:
• Because of the flooding, only hay and pasture plants that can tolerate short periods of wetness should be selected for planting. These plants include fescue and white clover.
• Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.

Woodland
Suitability: Well suited

Trees suitable for planting: Yellow poplar, black walnut, white oak, southern red oak, hickory, eastern white pine, loblolly pine
Management considerations:
• The main consideration affecting management of timber is the hazard of soil rutting.
• See table 8a for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Poorly suited to most of these uses
Management considerations:
• This soil is poorly suited to most residential and commercial uses because of the flooding and the wetness.
• Constructing dwellings, commercial structures, roads, and streets above the expected flood level helps to prevent the damage caused by flooding.

MmB2—Mimosa silty clay loam, 2 to 5 percent slopes, eroded

Setting

Landscape position: Undulating footslopes
Shape of areas: Irregular or oval
Size of areas: 25 to 75 acres
Major land use: Hay, pasture, or cropland

Typical Profile

Surface layer:
0 to 5 inches; dark brown silty clay loam
Subsoil:
5 to 9 inches; brown silty clay loam with brownish mottles
9 to 31 inches; yellowish brown clay
31 to 42 inches; yellowish brown clay with brownish mottles
42 inches; limestone bedrock

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Slow or very slow
Available water capacity: Moderate
Soil reaction: Moderately acid to very strongly acid, except where lime has been added
Flooding: None
Seasonal high water table: None
Depth to bedrock: 40 to 60 inches

Inclusions

• Small, severely eroded areas that have a surface layer of clay
• Small, intermingled areas of Gladdice and Barfield soils on footslopes
• Small, concave areas of soils that are more than 5 feet deep over hard bedrock

Use and Management

Cropland
Suitability: Suited
Management considerations:
• Accelerated erosion can remove valuable topsoil and adversely affect rooting depth.
• Conservation measures, such as no-till planting and contour stripcropping, help to control erosion and reduce the runoff rate.
• Tilth can be improved or maintained and soil moisture can be conserved by applying a cropping sequence that includes grasses, legumes, or a mixture of grasses and legumes; using proper crop rotations; minimizing tillage; and planting cover crops.
Capability subclass: 3e

Pasture and Hay
Suitability: Suited
Management considerations:
• Because of the slope, additional erosion is a hazard if plants are overgrazed or if the plant stand is in poor condition.
• Hay yields may be reduced in dry years because of the limited available water capacity.
• Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.

Woodland
Suitability: Well suited
Trees suitable for planting: Eastern white pine, yellow poplar, black walnut, white oak, hickory, white ash, southern red oak
Management considerations:
• The main consideration affecting management of timber is the hazard of soil rutting.
• See table 8a for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Poorly suited
Management considerations:
• Shrink-swell potential is a limitation on sites for dwellings and small commercial buildings.
• The shrink-swell potential and the depth to rock are limitations on sites for dwellings with basements.
• Low strength is a limitation on sites for local roads and streets.
• The restricted permeability in the subsoil is a major limitation on sites for septic tank absorption fields.
• Backfilling deep cuts with material that has low shrink-swell potential and diverting runoff away from

buildings help to prevent structural damage to dwellings.
• Adding coarser textured base material helps to prevent the damage to local roads and streets caused by low strength.

MmC2—Mimosa silty clay loam, 5 to 12 percent slopes, eroded

Setting

Landscape position: Rolling footslopes
Shape of areas: Irregular
Size of areas: 25 to 75 acres
Major land use: Hay or pasture

Typical Profile

Surface layer:
0 to 5 inches; dark brown silty clay loam
Subsoil:
5 to 9 inches; brown silty clay loam with brownish mottles
9 to 31 inches; yellowish brown clay
31 to 42 inches; yellowish brown clay with brownish mottles
42 inches; limestone bedrock

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Slow or very slow
Available water capacity: Moderate
Soil reaction: Slightly acid to very strongly acid, except where lime has been added
Flooding: None
Seasonal high water table: None
Depth to bedrock: 40 to 60 inches

Inclusions

• Small, severely eroded areas that have a surface layer of clay
• Small, intermingled areas of Gladdice and Barfield soils on footslopes
• Small, concave areas of soils that are more than 5 feet deep over hard bedrock

Use and Management

Cropland
Suitability: Poorly suited
Management considerations:
• This soil should not be used continuously as cropland because of the slope and the high erosion potential.
• Contour farming and a crop rotation system in which a vegetative cover is maintained for several seasons following cultivation help to control erosion.
• Conservation measures, such as no-till planting and contour stripcropping, help to control erosion and reduce the runoff rate.
Capability subclass: 4e

Pasture and Hay
Suitability: Suited
Management considerations:
• Because of the slope, additional erosion is a hazard if plants are overgrazed or if the plant stand is in poor condition.
• Pastures should be renovated when the amount of better forage plants in stands has decreased to less than needed for optimum production.
• Adjusting stocking rates, especially in areas on the steeper slopes, helps to prevent overgrazing and control erosion.
• Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.

Woodland
Suitability: Suited
Trees suitable for planting: Eastern white pine, yellow poplar, black walnut, white oak, hickory, white ash, southern red oak
Management considerations:
• The main considerations in managing for timber are the hazard of soil rutting and the hazard of erosion on roads and trails.
• See tables 8a and 8b for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Poorly suited
Management considerations:
• A shrink-swell potential and the slope are limitations on sites for small commercial buildings.
• The shrink-swell potential, the slope, and the depth to rock are limitations on sites for dwellings with basements.
• Low strength is a limitation on sites for local roads and streets.
• The restricted permeability in the subsoil and the slope are major limitations on sites for septic tank absorption fields.
• Backfilling deep cuts with material that has low shrink-swell potential and diverting runoff away from buildings help to prevent structural damage to dwellings.

• Adding coarser textured base material helps to prevent the damage to local roads and streets caused by low strength.
• Building roads and streets in the less sloping areas reduces the amount of cut and fill needed.

MmD2—Mimosa silty clay loam, 12 to 20 percent slopes, eroded

Setting

Landscape position: Hillsides
Shape of areas: Irregular
Size of areas: 5 to 45 acres
Major land use: Woodland or pasture

Typical Profile

Surface layer:
0 to 5 inches; dark brown silty clay loam
Subsoil:
5 to 9 inches; brown silty clay loam with brownish mottles
9 to 31 inches; yellowish brown clay
31 to 42 inches; yellowish brown clay with brownish mottles
42 inches; limestone bedrock

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Slow or very slow
Available water capacity: Moderate
Soil reaction: Slightly acid to very strongly acid, except where lime has been added
Flooding: None
Seasonal high water table: None
Depth to bedrock: 40 to 60 inches

Inclusions

• Small, severely eroded areas that have a surface layer of clay
• Dellrose and Sykes soils on the lower footslopes
• Small, concave areas of soils that are more than 5 feet deep to hard bedrock

Use and Management

Cropland
Suitability: Unsuited
Management considerations:
• The slope, the depth to bedrock, the hazard of erosion, the limited available water capacity, and the texture of the surface layer and subsoil are limitations affecting management and production.
• Other areas should be considered.

Capability subclass: 6e

Pasture and Hay
Suitability: Suited
Management considerations:
• Because of the slope, additional erosion is a hazard if plants are overgrazed or if the plant stand is in poor condition.
• Pastures should be renovated when the amount of better forage plants in stands has decreased to less than needed for optimum production.
• Adjusting stocking rates, especially in areas on the steeper slopes, helps to prevent overgrazing and control erosion.
• Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.

Woodland
Suitability: Poorly suited
Trees suitable for planting: Eastern white pine, yellow poplar, black walnut, white oak, hickory, white ash, southern red oak
Management considerations:
• The main considerations in managing for timber are the suitability for log landings, the hazard of soil rutting, the hazard of erosion on roads and trails, and the suitability for roads.
• See tables 8a and 8b for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Poorly suited
Management considerations:
• A shrink-swell potential and the slope are limitations on sites for dwellings and small commercial buildings.
• The shrink-swell potential, the slope, and the depth to rock are limitations on sites for dwellings with basements.
• Low strength is a limitation on sites for local roads and streets.
• The restricted permeability in the subsoil and the slope are major limitations on sites for septic tank absorption fields.
• Backfilling deep cuts with material that has low shrink-swell potential and diverting runoff away from buildings help to prevent structural damage to dwellings.
• Adding coarser textured base material helps to prevent the damage to local roads and streets caused by low strength.
• Building roads and streets in the less sloping areas reduces the amount of cut and fill needed.

Mn—Minter silt loam, occasionally flooded

Setting

Landscape position: Flood plains
Shape of areas: Long and narrow
Size of areas: 5 to 100 acres
Slope: 0 to 2 percent
Major land use: Woodland and wetland wildlife habitat

Typical Profile

Surface layer:
0 to 7 inches; dark grayish brown silt loam
Subsoil:
7 to 16 inches; gray silty clay loam
16 to 22 inches; gray silty clay
22 to 29 inches; gray silty clay with brown mottles
29 to 68 inches; gray silty clay loam with brown mottles

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Very slow
Available water capacity: High
Soil reaction: Strongly acid or moderately acid in the upper part of the subsoil; strongly acid to neutral in the lower part
Flooding: Occasional; long periods in winter and early spring
High water table: Within 0.5 to 1.0 foot of the surface in winter and spring
Depth to bedrock: More than 5 feet

Inclusions

- Small areas of moderately well drained Lindside soils in the slightly higher positions
- Small, narrow strips of the well drained Staser and Arrington soils
- Small areas of moderately well drained Swafford soils on stream terraces

Use and Management

Cropland
Suitability: Unsuited
Management considerations:
- The seasonal wetness and the flooding limit the production and harvest of row crops.
- Other areas should be considered.

Capability subclass: 4w

Pasture and Hay
Suitability: Poorly suited
Management considerations:
- This soil is poorly suited to pasture and hay because of the flooding and the seasonal wetness.
- In some fringe areas of the unit where flooding is less severe, water-tolerant plants, such as tall fescue and white clover, may be grown for pasture.
- Grazing should be limited to dry months in late summer and early fall when the soil is least susceptible to compaction.

Woodland
Suitability: Suited only to water-tolerant trees; poorly suited to most forestry operations; excellent habitat for wetland wildlife
Trees suitable for planting: American sycamore, Nuttall oak, sweetgum, willow oak, cherrybark oak, swamp white oak, green ash, pin oak
Management considerations:
- The main considerations in managing for timber are the limitations affecting the construction of haul roads and log landings, the suitability for log landings, the hazard of soil rutting, the suitability for roads, the suitability for hand planting, the suitability for mechanical planting, the suitability for use of harvesting equipment, and the suitability for mechanical site preparation.
- See tables 8a-8d for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Unsuited
Management considerations:
- This soil is unsuited to all residential and commercial uses because of the flooding and the seasonal wetness.

MtB2—Mountview silt loam, 2 to 5 percent slopes, eroded

Setting

Landscape position: Undulating ridgetops, in the southeastern part of the county
Shape of areas: Irregular
Size of areas: 5 to 30 acres
Major land use: Cropland or hay

Typical Profile

Surface layer:
0 to 2 inches; brown silt loam
Subsurface layer:
2 to 8 inches; yellowish brown silt loam with brownish mottles
Subsoil:
8 to 18 inches; yellowish brown silty clay loam

18 to 39 inches; strong brown silty clay loam with reddish and grayish mottles
39 to 80 inches; red silty clay with yellowish and brownish mottles

Soil Properties and Qualities

Drainage class: Well drained and moderately well drained
Permeability: Moderate
Available water capacity: High
Soil reaction: Strongly acid or very strongly acid, except where lime has been added
Flooding: None
Seasonal high water table: 1.5 to 2.1 feet in winter and early spring (perched)
Depth to bedrock: More than 5 feet

Inclusions

- Small areas of Dickson soils in saddles and slight depressions.
- Sengtown and Christian soils in sloping areas adjacent to the steeper side slopes
- Small areas of Sugargrove soils on shoulder slopes in the southeastern part of the county

Use and Management

Cropland
Suitability: Well suited
Management considerations:
- Most locally adapted crops can be grown and can produce good yields.
- Applying a conservation tillage system helps to prevent damage from erosion.
- No-till planting, contour farming, and stripcropping help to control erosion and maintain productivity.

Capability subclass: 2e

Pasture and Hay
Suitability: Well suited
Management considerations:
- No significant limitations affect forage production if erosion is controlled.
- Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.
- Alfalfa grows well and produces good yields in areas where lime and fertilizer applications are adequate and other necessary management practices have been applied.

Woodland
Suitability: Well suited
Trees suitable for planting: Yellow poplar, white oak, southern red oak, hickory, eastern white pine
Management considerations:
- The main considerations for management of timber are the hazard of soil rutting and the suitability for mechanical preparation.
- See tables 8a and 8d for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Suited
Management considerations:
- Low strength is the major limitation on sites for local roads and streets.
- The restricted permeability in the lower part of the subsoil is a limitation on sites for septic tank absorption fields.
- A shrink-swell potential in the lower part of the subsoil is a limitation on sites for dwellings with basements.
- Adding coarser textured base material helps to prevent the damage to local roads and streets caused by low strength.
- Increasing the size of septic tank absorption fields helps to compensate for the restricted permeability.
- Backfilling deep cuts with material that has low shrink-swell potential and diverting runoff away from buildings help to prevent structural damage to dwellings.

MtC2—Mountview silt loam, 5 to 12 percent slopes, eroded

Setting

Landscape position: Rolling ridgetops
Shape of areas: Irregular
Size of areas: 5 to 150 acres
Major land use: Hay or pasture

Typical Profile

Surface layer:
0 to 2 inches; brown silt loam
Subsurface layer:
2 to 8 inches; yellowish brown silt loam with brownish mottles
Subsoil:
8 to 18 inches; yellowish brown silty clay loam
18 to 39 inches; strong brown silty clay loam with reddish and grayish mottles
39 to 80 inches; red silty clay with yellowish and brownish mottles

Soil Properties and Qualities

Drainage class: Well drained or moderately well drained
Permeability: Moderate

Available water capacity: High
Soil reaction: Strongly acid or very strongly acid, except where lime has been added
Flooding: None
Seasonal high water table: 1.5 to 2.1 feet in winter and early spring (perched)
Depth to bedrock: More than 5 feet

Inclusions

- Small areas of Dickson soils in saddles and slight depressions.
- Christian soils in sloping areas adjacent to the steeper side slopes
- Small areas of Sugargrove soils on shoulder slopes, in the southeastern part of the county

Use and Management

Cropland
Suitability: Suited
Management considerations:
- Accelerated erosion can remove valuable topsoil and adversely affect rooting depth.
- Conservation measures, such as no-till planting and contour stripcropping, help to control erosion and reduce the runoff rate.
- Tilth can be improved or maintained by applying a cropping sequence that includes grasses, legumes, or a mixture of grasses and legumes; using proper crop rotations; minimizing tillage; and planting cover crops.

Capability subclass: 3e

Pasture and Hay
Suitability: Well suited
Management considerations:
- Because of the slope, additional erosion is a hazard if plants are overgrazed or if the plant stand is in poor condition.
- Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.
- Alfalfa grows well and produces good yields in areas where lime and fertilizer applications are adequate and other necessary management practices have been applied.

Woodland
Suitability: Well suited
Trees suitable for planting: Yellow poplar, white oak, southern red oak, hickory, eastern white pine
Management considerations:
- The main considerations for management of timber are the hazard of soil rutting, the hazard of erosion on roads and trails, and the suitability for mechanical site preparation.
- See tables 8a and 8c for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Suited
Management considerations:
- The slope is the major limitation on sites for small commercial buildings.
- Low strength is the major limitation on sites for local roads and streets.
- The slope and the restricted permeability in the lower part of the subsoil are limitations on sites for septic tank absorption fields.
- The slope and a shrink-swell potential in the lower part of the subsoil are limitations on sites for dwellings.
- Construction costs and proper design are major considerations if sites for dwellings and small commercial buildings are excavated or filled.
- Building roads and streets in the less sloping areas reduces the amount of cut and fill needed.
- Adding coarser textured base material helps to prevent the damage to local roads and streets caused by low strength.
- Increasing the size of septic tank absorption fields and installing distribution lines on the contour help to compensate for slope and the restricted permeability.
- Backfilling deep cuts with material that has low shrink-swell potential and diverting runoff away from buildings help to prevent structural damage to dwellings.

Oc—Ocana gravelly silt loam, occasionally flooded

Setting

Landscape position: Flood plains
Slope: 0 to 3 percent
Shape of areas: Long and narrow
Size of areas: 10 to 50 acres
Major land use: Hay, pasture, or, in a few areas, cropland

Typical Profile

Surface layer:
0 to 7 inches; brown gravelly silt loam
Subsoil:
7 to 17 inches; brown gravelly silt loam
17 to 36 inches; dark yellowish brown gravelly loam
36 to 48 inches; dark yellowish brown gravelly clay loam
Substratum:
48 to 65 inches; brown very gravelly loam

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderately rapid
Available water capacity: Moderate
Soil reaction: Moderately acid to neutral
Flooding: Occasional; very brief periods in winter and spring
Seasonal high water table: None
Depth to bedrock: More than 40 inches

Inclusions

- Moderately well drained Lindside soils in narrow strips below steep hillsides
- Intermingled areas of Skidmore soils at the mouth of creeks
- Small areas of sandy soils along creek channels and where streams intersect

Use and Management

Cropland
Suitability: Suited
Management considerations:
- The rock fragments in the surface layer and subsoil can hinder tillage.
- Small grain and early season annuals can be damaged by the flooding.
- Planting crops later in the season will lessen the risk of damage by flooding.
- Planting small grain in the higher areas not subject to flooding is recommended.
- Planting cover crops and no-till farming help to conserve soil moisture and retain nutrients.

Capability subclass: 2w

Pasture and Hay
Suitability: Suited
Management considerations:
- The short periods of flooding can result in damage to forage plants.
- Grasses and legumes that can tolerate short periods of wetness should be selected for planting. They include tall fescue and ladino clover.
- Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.

Woodland
Suitability: Well suited
Trees suitable for planting: Black walnut, white ash, yellow poplar, American sycamore, sweetgum, cherrybark oak
Management considerations:
- The main consideration affecting management of timber is the hazard of soil rutting.
- See table 8a for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Poorly suited
Management considerations:
- This soil is poorly suited to all residential and commercial uses because of the flooding.
- Constructing dwellings, commercial structures, roads, and streets above the expected flood level helps to prevent the damage caused by flooding.

Sk—Skidmore gravelly loam, occasionally flooded

Setting

Landscape position: Flood plains
Slope: 0 to 3 percent
Shape of areas: Long and narrow
Size of areas: 10 to 50 acres
Major land use: Hay, pasture, or, in a few areas, cropland

Typical Profile

Surface layer:
0 to 10 inches; brown gravelly loam
Subsoil:
10 to 19 inches; brown very gravelly coarse sandy loam
19 to 24 inches; brown very gravelly clay loam
Substratum:
24 to 32 inches; brown extremely gravelly clay loam
32 to 48 inches; brown extremely gravelly coarse sandy loam
48 to 65 inches; dark yellowish brown extremely gravelly coarse sandy loam

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderately rapid or rapid
Available water capacity: Low
Soil reaction: Moderately acid to neutral
Flooding: Occasional; very brief periods in winter and spring
Depth to water table: 3 to 4 feet in winter and early spring
Depth to bedrock: More than 40 inches

Inclusions

- Moderately well drained Lindside soils in narrow strips below steep side slopes
- Intermingled areas of Arrington and Armour soils
- Humphreys soils on the slightly higher knolls

Use and Management

Cropland
Suitability: Poorly suited
Management considerations:
• The large volume of fragments in the surface layer and subsoil can hinder tillage.
• Droughtiness and nutrient leaching are major limitations affecting crop production.
• Small grain and early season annuals can be damaged by the occasional flooding.
• Planting crops later in the season will lessen the risk of damage by flooding.
• Small grain should be planted in the higher areas not subject to flooding.
• Planting cover crops and no-till farming help to conserve soil moisture and retain nutrients.
• Applications of lime and fertilizer are needed to help maintain productivity.
Capability subclass: 3s

Pasture and Hay
Suitability: Suited
Management considerations:
• The droughtiness and low fertility are concerns for hay and pasture management.
• The short periods of flooding can result in damage to forage plants.
• Pastures should be renovated when the amount of better forage plants in stands has decreased to less than needed for optimum production.
• Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.

Woodland
Suitability: Poorly suited
Trees suitable for planting: Black walnut, white ash, yellow poplar, American sycamore, sweetgum, cherrybark oak
Management considerations:
• The main considerations in managing for timber are the limitations affecting the construction of haul roads and log landings, the suitability for log landings, the suitability for roads, and the suitability for mechanical site preparation.
• See tables 8a, 8b, 8c, and 8d for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Poorly suited
Management considerations:
• This soil is poorly suited to all residential and commercial uses because of the flooding.
• Constructing dwellings, commercial structures, roads, and streets above the expected flood level helps to prevent the damage caused by flooding.

St—Staser loam, occasionally flooded

Setting

Landscape position: Flood plains
Shape of areas: Long and narrow
Size of areas: 5 to 100 acres
Slope: 0 to 2 percent
Major land use: Cropland or hay

Typical Profile

Surface layer:
0 to 7 inches; brown loam
Subsurface layer:
7 to 32 inches; dark brown loam
Subsoil:
32 to 41 inches; dark brown loam
41 to 51 inches; dark yellowish brown loam
51 to 80 inches; dark yellowish brown fine sandy loam

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Soil reaction: Moderately acid to neutral
Flooding: Occasional; very brief periods in winter and early spring
Seasonal high water table: None
Depth to bedrock: More than 5 feet

Inclusions

• Small areas of Skidmore soils along natural stream levees
• Poorly drained Minter soils and moderately well drained Lindside soils in depressions and in narrow strips adjacent to steep upland hillsides

Use and Management

Cropland
Suitability: Well suited
Management considerations:
• In most years, locally adapted crops can be grown and can produce good yields.
• Small grain crops produce good yields, but they can be damaged by the occasional flooding.
• The flooding, which occurs in winter and early spring, is not a limitation affecting the production of most crops.
Capability subclass: 2w

Pasture and Hay
Suitability: Well suited

Management considerations:
• Because of the flooding, only hay and pasture plants that can tolerate short periods of wetness should be selected for planting. These plants include fescue and white clover.
• Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.

Woodland
Suitability: Well suited
Trees suitable for planting: Yellow poplar, black walnut, white oak, southern red oak, hickory, eastern white pine, loblolly pine
Management considerations:
• The main consideration affecting management of timber is the hazard of soil rutting.
• See table 8a for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Poorly suited to most of these uses
Management considerations:
• This soil is poorly suited to most residential and commercial uses because of the flooding.
• Constructing dwellings, commercial structures, roads, and streets above the expected flood level helps to prevent the damage caused by flooding.

SuC2—Sugargrove gravelly silt loam, 5 to 12 percent slopes, eroded

Setting

Landscape position: Rolling ridgetops
Shape of areas: Irregular
Size of areas: 5 to 35 acres
Major land use: Pasture or hay

Typical Profile

Surface layer:
0 to 3 inches; brown gravelly silt loam with brownish mottles
Subsurface layer:
3 to 12 inches; yellowish brown gravelly silt loam with yellowish mottles
Subsoil:
12 to 51 inches; brownish yellow gravelly silty clay loam
Substratum:
51 to 65 inches; alternating strata of highly fractured siltstone, chert bands, and silty clay loam soil material

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderately rapid or moderate
Available water capacity: Moderate
Soil reaction: Strongly acid or very strongly acid, except where lime has been added
Flooding: None
Seasonal high water table: None
Depth to soft bedrock: 20 to 60 inches

Inclusions

• Small, intermingled areas of well drained Christian soils on convex knolls
• Somewhat excessively drained Hawthorne soils on shoulder slopes

Use and Management

Cropland
Suitability: Suited
Management considerations:
• Accelerated erosion can remove valuable topsoil and adversely affect rooting depth.
• Coarse fragments on or near the surface of the soil can hinder tillage and limit the amount of moisture available to plants in dry years.
• Most of the cropland is on narrow, winding ridges in remote areas.
• No-till planting, contour farming, stripcropping, and growing cover crops help to conserve soil moisture and control erosion.
• Tilth can be improved or maintained by applying a cropping sequence that includes grasses, legumes, or a mixture of grasses and legumes; using proper crop rotations; and returning crop residue to the soil.
Capability subclass: 3e

Pasture and Hay
Suitability: Well suited
Management considerations:
• Because of the slope, additional erosion is a hazard if plants are overgrazed or if the plant stand is in poor condition.
• In dry years low available water can reduce hay yields.
• Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.

Woodland
Suitability: Well suited
Trees suitable for planting: Yellow poplar, black walnut, white oak, white ash, hickory, sweetgum, loblolly pine
Management considerations:
• The main considerations for managing timber are the hazard of soil rutting and the hazard of erosion on roads and trails.

• See tables 8a and 8b for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Suited
Management considerations:
• The slope and the depth to rock are limitations on sites for septic tank absorption fields.
• The slope and the depth to rock are limitations on sites for small commercial buildings and dwellings.
• The slope is a concern on sites for local roads and streets.
• Construction costs and proper design are major considerations if sites for dwellings and small commercial buildings are excavated or filled.
• Building roads and streets in the less sloping areas reduces the amount of cut and fill needed.

SuD2—Sugargrove gravelly silt loam, 12 to 20 percent slopes, eroded

Setting

Landscape position: Hillsides
Shape of areas: Irregular
Size of areas: 25 to 75 acres
Major land use: Pasture or woodland

Typical Profile

Surface layer:
0 to 3 inches; brown gravelly silt loam with brownish mottles
Subsurface layer:
3 to 12 inches; yellowish brown gravelly silt loam with yellowish mottles
Subsoil:
12 to 51 inches; brownish yellow gravelly silty clay loam
Substratum:
51 to 65 inches; alternating strata of highly fractured siltstone, chert bands, and silty clay loam soil material.

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderately rapid or moderate
Available water capacity: Moderate
Soil reaction: Strongly acid or very strongly acid, except where lime has been added
Flooding: None
Seasonal high water table: None
Depth to soft bedrock: 20 to 60 inches

Inclusions

• Small, intermingled areas of well drained Christian soils on convex knolls
• Somewhat excessively drained Hawthorne soils on shoulder slopes

Use and Management

Cropland
Suitability: Poorly suited
Management considerations:
• This soil should not be used continuously as cropland because of the slope and the severe erosion hazard.
• Contour farming and a crop rotation system in which a vegetative cover is maintained for several seasons following cultivation help to control erosion.
• Conservation measures, such as no-till planting and contour stripcropping, help to control erosion and reduce the runoff rate.
Capability subclass: 4e

Pasture and Hay
Suitability: Suited
Management considerations:
• Pastures should be renovated when the amount of better forage plants in stands has decreased to less than needed for optimum production.
• Adjusting stocking rates, especially in areas on the steeper slopes, helps to prevent overgrazing and control erosion.
• Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.

Woodland
Suitability: Poorly suited
Trees suitable for planting: Yellow poplar, black walnut, white oak, white ash, hickory, sweetgum, loblolly pine
Management considerations:
• The main considerations in managing for timber are the suitability for log landings, the hazard of soil rutting, the hazard of erosion on roads and trails, and the suitability for roads.
• See tables 8a and 8b for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Poorly suited
Management considerations:
• The slope and the depth to rock are limitations affecting most residential and commercial uses.
• Other sites should be considered.

SwB—Swafford loam, 2 to 5 percent slopes

Setting

Landscape position: Broad, undulating terraces along the Cumberland River
Shape of areas: Rectangular
Size of areas: 5 to 80 acres
Major land use: Cropland or hay

Typical Profile

Surface layer:
0 to 9 inches; yellowish brown loam
Subsoil:
9 to 25 inches; yellowish brown clay loam with brownish and reddish mottles
25 to 35 inches; brownish yellow clay loam with brownish and grayish mottles
35 to 55 inches; brownish yellow clay loam with grayish mottles
55 to 70 inches; light yellowish brown clay loam with brownish, reddish, and grayish mottles

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderately slow
Available water capacity: High
Soil reaction: Very strongly acid to moderately acid, except where lime has been added
Flooding: None
Depth to water table: 1.8 to 2.4 feet in winter and early spring (perched)
Depth to bedrock: More than 5 feet

Inclusions

- A few intermingled areas of well drained Armour and Holston soils
- Small areas of well drained Arrington and Staser soils in low landscape positions
- A few small areas of a somewhat poorly drained soil at the base of side slopes

Use and Management

Cropland
Suitability: Well suited
Management considerations:
- Most climatically adapted crops grow well if management measures are applied to help control erosion.
- The wetness in winter and early spring can restrict rooting depth and plant germination.
- Cover crops, crop rotations, crop residue management, and a conservation tillage system help to control erosion and conserve soil moisture.
- Planting crops later in the spring will improve plant germination and early growth.

Capability subclass: 2e

Pasture and Hay
Suitability: Well suited
Management considerations:
- Because of the seasonal wetness, only hay and pasture plants that can tolerate short periods of wetness should be selected for planting. These plants include fescue and white clover.
- The perched water table limits grazing for several days at a time in winter and early spring.
- Grazing should be deferred until late spring and then discontinued in early fall.
- Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.

Woodland
Suitability: Well suited
Trees suitable for planting: White oak, southern red 0ak, yellow poplar, eastern white pine, loblolly pine
Management considerations:
- The main consideration affecting management of timber is the hazard of soil rutting.
- See table 8a for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Poorly suited
Management considerations:
- The perched water table and the restricted permeability in the subsoil are major limitations on sites for septic tank absorption fields.
- The seasonal wetness is a limitation on sites for dwellings and commercial buildings.
- Low strength and the wetness are major limitations on sites for local roads and streets.
- A subsurface drainage system helps to lower the water table on sites for septic tank absorption fields, dwellings, and commercial buildings.
- Adding coarser textured base material helps to prevent the damage to local roads and streets caused by low strength.

SwC—Swafford loam, 5 to 12 percent slopes

Setting

Landscape position: Rolling stream terraces along the Cumberland River
Shape of areas: Irregular
Size of areas: 25 to 75 acres
Major land use: Cropland or hay

Typical Profile

Surface layer:
0 to 9 inches; yellowish brown loam
Subsoil:
9 to 25 inches; yellowish brown clay loam with brownish and reddish mottles
25 to 35 inches; brownish yellow clay loam with brownish and grayish mottles
35 to 55 inches; brownish yellow clay loam with grayish mottles
55 to 70 inches; light yellowish brown clay loam with brownish, reddish, and grayish mottles

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderately slow
Available water capacity: High
Soil reaction: Very strongly acid to moderately acid, except where lime has been added
Flooding: None
Depth to water table: 1.8 to 2.4 feet in winter and early spring (perched)
Depth to bedrock: More than 5 feet

Inclusions

- A few intermingled areas of well drained Armour and Holston soils
- Small areas of well drained Arrington and Staser soils in low landscape positions
- A few small areas of a somewhat poorly drained soil at the base of side slopes

Use and Management

Cropland
Suitability: Suited
Management considerations:
- Accelerated erosion can remove valuable topsoil and adversely affect rooting depth.
- The wetness in winter and early spring can restrict rooting depth and plant germination.
- Conservation measures, such as no-till planting and contour stripcropping, help to control erosion and reduce the runoff rate.
- Planting crops later in the spring will improve plant germination and early growth.

Capability subclass: 3e

Pasture and Hay
Suitability: Well suited
Management considerations:
- Because of the seasonal wetness, only hay and pasture plants that can tolerate short periods of wetness should be selected for planting. These plants include fescue and white clover.
- A perched water table limits grazing for several days at a time in winter and early spring.
- Grazing should be deferred until late spring and then discontinued in early fall.
- Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.

Woodland
Suitability: Well suited
Trees suitable for planting: White oak, southern red oak, yellow poplar, eastern white pine
Management considerations:
- The main considerations for managing timber are the hazard of soil rutting and the hazard of erosion on roads and trails.
- See tables 8a and 8b for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Poorly suited
Management considerations:
- The perched water table, the restricted permeability, and the slope are major limitations on sites for septic tank absorption fields.
- The seasonal wetness is a limitation on sites for dwellings and commercial buildings.
- Low strength and the wetness are major limitations on sites for local roads and streets.
- A subsurface drainage system helps to lower the water table on sites for septic tank absorption fields, dwellings, and commercial buildings.
- Adding coarser textured base material helps to prevent the damage to local roads and streets caused by low strength.

SyB2—Sykes silt loam, 2 to 5 percent slopes, eroded

Setting

Landscape position: Undulating stream terraces, north of the Cumberland River
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major land use: Cropland

Typical Profile

Surface layer:
0 to 5 inches; brown silt loam
Subsoil:
5 to 24 inches; dark yellowish brown silty clay loam
24 to 50 inches; yellowish brown silty clay
50 to 80 inches; yellowish brown clay

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate in the upper part; slow or very slow in the lower part
Available water capacity: High
Soil reaction: Slightly acid to strongly acid, except where lime has been added
Flooding: None
Seasonal high water table: None
Depth to bedrock: More than 5 feet

Inclusions

- Small areas of Humphreys soils on terrace escarpments and footslopes
- Small areas of Armour and Mimosa soils in the higher landscape positions

Use and Management

Cropland
Suitability: Well suited
Management considerations:
- Most locally adapted crops can be grown and can produce good yields.
- This soil is susceptible to erosion, which can result in removal of valuable topsoil.
- No-till planting, contour farming, and stripcropping help to control erosion and maintain productivity.

Capability subclass: 2e

Pasture and Hay
Suitability: Well suited
Management considerations:
- No significant limitations affect forage production if erosion is controlled (fig. 7).
- Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.
- Alfalfa grows well and produces good yields in areas where lime and fertilizer applications are adequate and other necessary management practices have been applied.

Woodland
Suitability: Well suited
Trees suitable for planting: Yellow poplar, black walnut, white oak, southern red oak, hickory, eastern white pine, and loblolly pine

Figure 7.—A winter cover crop of wheat and vetch in an area of Sykes silt loam, 2 to 5 percent slopes, eroded, helps to control erosion and reduce the runoff rate.

Management considerations:
• The main consideration affecting management of timber is the hazard of soil rutting.
• See table 8a for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Suited
Management considerations:
• The restricted permeability in the lower part of the subsoil is a major limitation on sites for septic tank absorption fields.
• Shrink-swell potential is a limitation on sites for dwellings with basements.
• Low strength is a limitation on sites for local roads and streets.
• Increasing the size of septic tank absorption fields helps to compensate for the restricted permeability.
• Backfilling deep cuts with material that has low shrink-swell potential and diverting runoff away from buildings help to prevent structural damage to dwellings.
• Adding coarser textured base material helps to prevent the damage to local roads and streets caused by low strength.

SyC2—Sykes silt loam, 5 to 12 percent slopes, eroded

Setting

Landscape position: Rolling stream terraces, north of the Cumberland River
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major land use: Cropland

Typical Profile

Surface layer:
0 to 5 inches; brown silt loam
Subsoil:
5 to 24 inches; dark yellowish brown silty clay loam
24 to 50 inches; yellowish brown silty clay
50 to 80 inches; yellowish brown clay

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate in the upper part; slow or very slow in the lower part
Available water capacity: High
Soil reaction: Slightly acid to strongly acid, except where lime has been added
Flooding: None
Seasonal high water table: None
Depth to bedrock: More than 5 feet

Inclusions

• Small areas of Humphreys soils on terrace escarpments and footslopes
• Small areas of Armour and Mimosa soils in the higher landscape positions

Use and Management

Cropland
Suitability: Suited
Management considerations:
• Accelerated erosion can remove valuable topsoil and adversely affect rooting depth.
• Conservation measures, such as no-till planting and contour stripcropping, help to control erosion and reduce the runoff rate.
• Tilth can be improved or maintained by applying a cropping sequence that includes grasses, legumes, or a mixture of grasses and legumes; using proper crop rotations; minimizing tillage; and planting cover crops.
Capability subclass: 3e

Pasture and Hay
Suitability: Well suited
Management considerations:
• Because of the slope, additional erosion is a hazard if plants are overgrazed or if the plant stand is in poor condition.
• Pasture rotation, weed control, and an annual application of fertilizer help to maintain the quality and quantity of forage.
• Alfalfa grows well and produces good yields in areas where lime and fertilizer applications are adequate and other necessary management practices have been applied.

Woodland
Suitability: Well suited
Trees suitable for planting: Yellow poplar, black walnut, white oak, southern red oak, hickory, eastern white pine, loblolly pine
Management considerations:
• The main considerations for management of timber are the hazard of soil rutting and the hazard of erosion on roads and trails.
• See tables 8a and 8b for additional information concerning forestland management.

Residential and Commercial Uses
Suitability: Suited
Management considerations:
• Low strength is the major limitation on sites for local roads and streets.
• The slope and the restricted permeability in the lower part of the subsoil are major limitations on sites for septic tank absorption fields.

- The slope is a limitation on sites for dwellings and small commercial buildings.
- The slope and shrink-swell potential are limitations on sites for dwellings with basements.
- Adding coarser textured base material helps to prevent the damage to local roads and streets caused by low strength.
- Increasing the size of septic tank absorption fields and installing distribution lines on the contour will help to compensate for the restricted permeability.
- Construction costs and proper design are major considerations if sites for dwellings and small commercial buildings are excavated or filled.
- Backfilling deep cuts with material that has low shrink-swell potential and diverting runoff away from buildings help to prevent structural damage to dwellings.

Ud—Udarents, clayey

This unit consists of areas that have been filled, graded, and disturbed in the process of urbanization; borrow areas where the soil material has been removed and used in the construction of roadbeds or as fill material for construction sites; and sanitary landfills.

In areas that have been filled, graded, and disturbed in the process of urbanization, the upper 2 to 5 feet of soil material has been added or reworked. The soil material remaining generally consists of clay with common or many pebbles, cobbles, and stones.

Borrow pits commonly are excavated to a depth of 10 to 50 feet. The soil material on the steep, vertical sidewalls is comparable to that described in the lower part of the subsoil of adjacent soils. The soil material at the bottom of pits in these borrow areas consists of gravelly and bouldery clay.

In landfill areas, the original soil material has been removed and the area has been filled with alternate layers of solid waste and soil material. Landfills that are no longer receiving waste material have been revegetated to trees or a permanent cover of grasses.

The exposed, clayey material in this unit will support plant growth. Most areas have an emerging vegetative cover of native grasses, shrubs, and trees. Some areas have been reclaimed to stands of eastern redcedar and loblolly pine. Acidity, the restricted rooting depth in some areas, the rock fragments, and the hazard of erosion are some of the limitations of the soil material. Because the areas are so diverse, onsite investigation is needed before use and management can be effectively planned.

This unit has not been assigned a land capability classification.

W—Water

This map unit consists of areas inundated with water for the entire year. It generally includes rivers, lakes, and ponds.

This unit has not been assigned a land capability classification.

Prime Farmland

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 supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The map units in the survey area that are considered prime farmland are listed in table 5. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

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 in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as forestland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; for agricultural waste management; and as 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.

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

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

John L. Kazda, state agronomist, Natural Resources Conservation Service, helped prepare this section.

General management needed for crops and pasture is suggested in this section. The estimated yields of the main crops and pasture plants are listed, the system of land capability classification used by the Natural Resources Conservation Service is explained, and prime farmland is described.

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." Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Pasture and hay are the major uses of the cleared land in Jackson County. The acreage in row crops has steadily decreased in recent years; however, row crops are still an important source of income in the county. Burley tobacco is the main cash crop, with a value of about $3.3 million in 1992. Other major crops are corn and forages.

The soils in the county are better suited to pasture than to row crops because they are too sloping for intensive cropping. The acreage in crops could be increased by applying erosion-control measures and utilizing the latest production technology available.

In addition to the commonly grown row crops, the county has increased production of vegetable truck crops, berries, and fruit orchards. The deep, well drained soils that warm up early in the spring are well suited to vegetables and fruit production. They include the Mountview and Bewleyville soils in the uplands and the Armour, Humphreys, Ocana, and Arrington soils on stream terraces and flood plains.

Most of the deep, well drained soils that are not steep are suited to orchards and vegetable production. The soils in low, poorly drained areas that experience frost frequently are poorly suited to fruit orchards and vegetable production.

Soil erosion is the most important management problem in Jackson County. It is a hazard on soils that have slopes of more than 2 percent when crops are grown using a conventional tillage system.

Soil loss through erosion is damaging for a number of reasons. Productivity is reduced as the surface layer is removed and part of the subsoil is incorporated into the plow layer. Erosion is especially damaging on soils that have a fragipan, such as the Dickson soils, and on soils that have a plastic, clayey subsoil, such as the

Mimosa soils. As more soil is removed by erosion, the root zone above the fragipan or clayey subsoil becomes thinner. This reduces the available water capacity and reduces yields during years of moisture stress. Loss of the surface layer with its higher content of organic matter also results in puddling and crusting. Most of the plant nutrients in the soil are in the surface layer, and they can easily be lost through erosion. Control of erosion minimizes the pollution of streams by sediment and fertilizers and improves the quality of water for recreation, fish, and wildlife.

A resource management system that provides a protective surface cover, reduces the rate of runoff, and increases the rate of infiltration can help hold erosion losses to an acceptable amount. On livestock farms, grasses and legumes help to control runoff and erosion and improve the soil-moisture-air relationship. The legumes take nitrogen from the air, and as a result, the amount of nitrogen fertilizer needed is reduced.

A conservation tillage system is one way to reduce erosion on sloping cropland. It provides for a more protective surface cover for longer periods and thus reduces the rate of runoff and increases the rate of infiltration. It also increases the amount of organic material added to the soil, minimizes soil compaction, and saves time and fuel. Crop residue management, field borders, grasses and legumes in the rotation cropping system, and grassed waterways are also helpful in holding erosion to an acceptable rate.

Most of the soils used for cultivated crops in the survey area have a surface layer of silt loam. Intense rainfall causes the formation of a crust on the surface of soils that have a low organic matter content. This crust, which is hard when dry, reduces the rate of infiltration and increases the rate of runoff. Regular addition and incorporation of crop residue, manure, or other organic material improve soil structure and minimize crusting.

Many of the soils in the county are strongly acid or very strongly acid in their natural state. Applications of agricultural lime are required to raise the pH level sufficiently for good growth of most crops. Most soils also show a good response to the addition of commercial fertilizer.

Addition of lime and fertilizer should be based on the results of soil tests and on the needs of the crop for a desired yield level. The Cooperative Extension Service operates a soil testing laboratory, and they can provide test results and recommendations for the amount of plant nutrients and lime to apply.

Pasture and hay make up a significant area in the county (fig. 8). The main grasses are tall fescue and orchardgrass. The most common legumes are white clover, red clover, ladino clover, alfalfa, annual lespedeza, and sericea lespedeza. Legumes should be included as part of the seed mixture for establishing pasture and should be reintroduced in perennial grass stands when they are renovated.

The major management practices needed on pastures are fertilization, weed control, a rotation grazing system, and occasional renovation. Fertilizer should be applied according to plant needs as indicated by plant growth, the level of production desired, and the results of soil tests. Weeds can be controlled in pastures by applying herbicides and mowing before the weeds mature and produce seeds. Well managed pastures that have a good stand of grasses and legumes contain fewer weeds.

Some annual grasses and legumes are used for supplemental grazing or for hay. Millet and soybeans are planted together and cut for hay. Hybrid sorghum crosses, pearl millet, and sudangrass make good summer pasture and also can be cut for hay. Small grain and annual ryegrass provide good grazing in late fall and early spring. Most hay harvested is the surplus growth of grass-legume pastures. Hay crops should be cut at the stage of growth that provides the best quality feed and does not damage the grass-legume stand. Hay cut late, after seed heads are mature, is less palatable and lower in protein content. The extra production that is gained by cutting late is offset by a decrease in the nutritional value of the hay. Cutting perennial hay too short causes premature loss of the stand.

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 tables 6 and 7. In any given year, yields may be higher or lower than those indicated in the tables because of variations in rainfall and other climatic factors. The land capability classification of map units in the survey area also is shown in the tables.

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

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen,

Figure 8.—Livestock production is a major agronomic enterprise in the county. Tall fescue and ladino clover are the main forage crops grown in areas of Holston loam, 2 to 5 percent slopes.

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.

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 tables 6 and 7 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 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 most kinds of field crops. 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 forestland or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

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, 2e. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, forestland, wildlife habitat, or recreation.

Forest Productivity and Management

Woodland makes up about 135,900 acres in the county, or about 69 percent of the total area of Jackson County, and most of it is privately owned. The county was entirely forested when the first settlers arrived. The areas first cleared were the fertile bottom land and stream terraces. Gradually, the uplands in the county were cleared for crops. The hazard of erosion was severe on the steeper hillsides. These areas were soon abandoned to volunteer grasses and trees as more arable land was cleared.

In general, forests now occupy the steeper slopes and droughty ridgetops, which are unsuited to row crops and poorly suited to pasture. The major timber species composition has changed very little over the last 200 years. It consists mainly of white oak, red oak, black oak, yellow poplar, beech, maple, sweetgum, black gum, and hickory. Occasionally, a pure stand of red cedar, which is associated with areas of shallow soils over limestone bedrock, can be seen along very steep bluffs.

Soils vary in their ability to support trees. Aspect has a major effect on tree species and growth in Jackson County. Available water capacity and depth of the root zone have major effects on tree growth. Fertility and soil texture also are important.

Two-thirds of the woodland is on moderately productive soils, with the potential to grow between 250 and 450 board feet per acre per year. One-fourth of the woodland is on productive soils, with the potential to grow between 450 and 600 board feet per acre per year. The remainder of the woodland has relatively low timber production potential. In addition to the commercial value of the woodland, other forest land uses include wildlife habitat, recreation, natural beauty, and conservation of soil, water, and air resources.

The tables in this section can help forest owners or managers plan the use of soils for wood crops. They show the potential productivity of the soils for wood crops and rate the soils according to the limitations that affect various aspects of forest management.

Forest Management

In tables 8a through 8d, interpretive ratings are given for various aspects of forest management. The ratings are both verbal and numerical.

Some rating class terms indicate the degree to which the soils are suited to a specified forest management practice. *Well suited* indicates that the soil has features that are favorable for the specified practice and has no limitations. Good performance can be expected, and little or no maintenance is needed.

Moderately suited indicates that the soil has features that are moderately favorable for the specified practice. One or more soil properties are less than desirable, and fair performance can be expected. Some maintenance is needed. *Poorly suited* indicates that the soil has one or more properties that are unfavorable for the specified practice. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. *Unsuited* indicates that the expected performance of the soil is unacceptable for the specified practice or that extreme measures are needed to overcome the undesirable soil properties.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified forest management practice (1.00) and the point at which the soil feature is not a limitation (0.00).

The paragraphs that follow indicate the soil properties considered in rating the soils for forest management practices. More detailed information about the criteria used in the ratings is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet.

For *limitations affecting construction of haul roads and log landings*, the ratings are based on slope, flooding, permafrost, plasticity index, the hazard of soil slippage, content of sand, the Unified classification, rock fragments on or below the surface, depth to a restrictive layer that is indurated, depth to a water table, and ponding. The limitations are described as slight, moderate, or severe. A rating of *slight* indicates that no significant limitations affect construction activities, *moderate* indicates that one or more limitations can cause some difficulty in construction, and *severe* indicates that one or more limitations can make construction very difficult or very costly.

The ratings of *suitability for log landings* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The soils are described as well suited, moderately suited, or poorly suited to use as log landings.

Ratings in the column *soil rutting hazard* are based on depth to a water table, rock fragments on or below the surface, the Unified classification, depth to a restrictive layer, and slope. Ruts form as a result of the operation of forest equipment. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that the soil is subject to little or no rutting, *moderate* indicates that rutting is likely, and *severe* indicates that ruts form readily.

Ratings in the column *hazard of off-road or off-trail erosion* are based on slope and on soil erodibility factor K. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance. The hazard is described as slight, moderate, severe, or very severe. A rating of *slight* indicates that erosion is unlikely under ordinary climatic conditions; *moderate* indicates that some erosion is likely and that erosion-control measures may be needed; *severe* indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and *very severe* indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

Ratings in the column *hazard of erosion on roads and trails* are based on the soil erodibility factor K, slope, and content of rock fragments. The ratings apply to unsurfaced roads and trails. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that little or no erosion is likely; *moderate* indicates that some erosion is likely, that the roads or trails may require occasional maintenance, and that simple erosion-control measures are needed; and *severe* indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

Ratings in the column *suitability for roads (natural surface)* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The ratings indicate the suitability for using the natural surface of the soil for roads. The soils are described as well suited, moderately suited, or poorly suited to this use.

Ratings in the columns *suitability for hand planting* and *suitability for mechanical planting* are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, moderately suited, poorly suited, or unsuited to these methods of planting. It is assumed that necessary site preparation is completed before seedlings are planted.

Ratings in the column *suitability for use of harvesting equipment* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, and ponding. The soils are described as well suited, moderately suited, or poorly suited to this use.

Ratings in the column *suitability for mechanical site preparation (surface)* are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 1 foot is considered in the ratings.

Ratings in the column *suitability for mechanical site preparation (deep)* are based on slope, depth to a restrictive layer, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 3 feet is considered in the ratings.

Forest Productivity

In table 8e, the *potential productivity* of merchantable or *common trees* on a soil is expressed as a site index and as a volume number. The *site index* is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that forest managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability. More detailed information regarding site index is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet.

The *volume of wood fiber*, a number, is the yield likely to be produced by the most important tree species. This number, expressed as cubic feet per acre per year and calculated at the age of culmination of the mean annual increment (CMAI), indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Trees to manage are those that are preferred for planting, seeding, or natural regeneration and those that remain in the stand after thinning or partial harvest.

Recreation

The soils in Jackson County generally are well suited to recreational uses such as picnic and playground areas, golf courses, field sports, campgrounds, hunting areas, and vacation farms. The soil, climate, scenery, and water quality offer good recreational potential. Soil characteristics should present few developmental problems if careful consideration is given to soil depth, permeability, texture, slope, and drainage in the planning process.

Streams and reservoirs formed from runoff and ground water in the soils support both good warm water and cold water fisheries. Cordell Hull Dam and Reservoir provides numerous water-based recreational opportunities, including swimming beaches, playgrounds, campsites, and boat launching ramps. Among the public recreation areas that have been developed adjacent to this lake are Wartrace Creek Park, Roaring River Park, and Salt Lick Creek Campground. Hunting is allowed in some areas owned by the U.S. Army Corps of Engineers by a permit system.

Some of the natural, scenic, and historic areas in the county are Avery Trace, Fort Blount, and Gainesboro.

The soils of the survey area are rated in table 9 according to 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 that are 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 the table, 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 a combination of these.

The information in table 9 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

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 mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Michael E. Zeman, state biologist, Natural Resources Conservation Service, helped to prepare this section.

Wildlife is an important natural resource of the county. It provides a source of revenue from hunting, fishing, and recreational activities, such as camping, boating, hiking, photography, and bird watching. Popular game species include bobwhite quail, cottontail rabbit, whitetail deer, mourning dove, eastern wild turkey, and gray and fox squirrels.

The whitetail deer is the most popular game animal in the county. Deer populations are high and have grown considerably over the past 20 years. Harvest records indicate that an increase of more than 20-fold occurred between 1970 and 1990, and the county is currently one of the top 10 deer producing counties in the State.

In the early 1950s, the wild turkey population had declined to a point where there were no birds in the county. Through restoration efforts and an abundance of suitable habitat, the county is now one of the top producers in the State. In the mid-1980s, about 20 birds per year were harvested. The number of birds harvested annually continues to increase.

The bobwhite quail numbers are low or moderate in the county. The highest populations occur on the Cordell Hull Lake-Cumberland River and Jennings Creek bottom land where cropland is adjacent to cover areas, such as brushy fence rows and field borders. Ruffed grouse populations are low, with the highest populations on the forested ridges of variable age classes of timber.

Rabbit populations are moderate or high in the county. Good populations occur on the Cordell Hull Lake-Cumberland River bottom land where agricultural land is intermixed with brushy areas.

The mourning dove is the most popular migratory game species in the State. Doves migrate through the county annually in fall and winter, with the largest numbers frequenting the bottom land along the Cordell Hull Lake-Cumberland River, Jennings Creek, and Roaring River.

There are three species of squirrels in the county—the gray, fox, and southern flying squirrels. All are plentiful. Both the gray squirrel and the primarily nocturnal southern flying squirrel are in good or excellent numbers throughout the hardwood forests. There also are a considerable number of fox squirrels in the county. Fox squirrels commonly are along woodland edges and woody fence rows near openland.

Waterfowl numbers are low in the county. The most common species migrating through the county include the wood duck, mallard, and blue winged teal. These waterfowl primarily utilize upland farm ponds, slackwater areas of the Cordell Hull Lake-Cumberland River, and riverine wetlands of the Cumberland River bottom.

Several species of furbearers live in the county. Wetland furbearers include mink, muskrat, and beaver. They are found in low or moderate numbers along streams, small lakes, and farm ponds. Upland furbearers are common and abundant throughout the county. They include bobcat, opossum, raccoon, gray fox, striped skunk, and coyote.

Many nongame species occur in abundance throughout the county. Different species of songbirds, both resident and migratory, can be found associated

with different plant communities. Woodland birds include the Carolina chickadee, tufted titmouse, pileated woodpecker, and warblers. Openland birds include robins, meadowlarks, and various sparrows. Common birds of prey include the red-tailed hawk, sparrow hawk, barred owl, and screech owl.

Other nongame species include reptiles, amphibians, and mammals. Common reptiles and amphibians include the eastern box turtle, skinks, eastern hognose snake, copperhead and timber rattlesnakes, bullfrogs, and dusky salamanders. Common small mammals include the hispid cotton rat, moles, shrews, and other rodents. The relative abundance of nongame species is dependent upon the type and quality of habitat available to the species.

State and federally listed threatened or endangered wildlife species that may live in the county include the gray bat, dromedary pearly mussel, orange-footed pearly mussel, yellow-blossom pearly mussel, ornate rocksnail, and river otter. Species that may migrate through the county include the bald eagle, golden eagle, peregrine falcon, osprey, sharp-shinned hawk, Cooper's hawk, and grasshopper sparrow. At least one pair of bald eagles and one pair of golden eagles have nested in the county in recent years.

Most of the soils in the county are only moderately limited as sites for ponds because of seepage or slope. Mimosa, Dellrose, and Hawthorne soils are severely limited as sites for constructed ponds because of seepage, slope, and depth to rock. Egam and Bewleyville soils are only slightly or moderately limited. Most of the ponds are used for livestock but can be stocked for recreational fishing. Common fish species include largemouth bass, bluegill sunfish, and channel catfish. Water in small ponds and lakes is typically acidic, which can limit fish production if proper management measures are not applied.

Jackson County has a total of 122 miles of perennial warm water streams, of which 39.5 miles consists of the Cumberland River. The Cumberland River and streams in the county provide approximately 1,098 acres of aquatic habitat. Common fish species that occur in these flowing systems include largemouth bass, rock bass, bluegill sunfish, green sunfish, channel catfish, bullhead catfish, and several species of darters and minnows. Rainbow trout are stocked in the Obey River in Clay County. As a result, some trout enter the Cumberland River in the northern part of the county. The Tennessee Wildlife Resources Agency has also released rainbow trout into Flynns Creek. Most of the streams are only moderately productive, with fair populations of warm water fish.

There is one commercial cold water aquaculture operation in the county. Springs seeping from the Highland Rim aquifer provide this operation with suitable water quality and the colder temperatures needed to support rainbow trout.

Overall, most of the soil characteristics and the steep topography render the area unsuitable as a site for construction of an extensive system of ponds. The soils in the Cumberland River basin and Highland Rim area have the highest potential for the construction of ponds and warm water aquaculture production.

There are few acres of natural wetlands in Jackson County, excluding artificial wetlands such as upland ponds. The wetlands are primarily wooded bottom land along stream courses and the Cumberland River. Lee, Guthrie, and Melvin soils are in these areas. Bottomland hardwoods provide some of the most productive wildlife habitat in the county. They improve the water quality of streams by removing nutrients and trapping sediment from upland runoff, lower water temperatures by shading streams, and provide leaf litter that serves as the foundation for aquatic food chains.

Conservation practices can improve or help to provide quality wildlife habitat. In areas of cropland, planned crop rotations and crop residue management can provide food and needed winter cover for many species of wildlife. In areas of grassland, deferred grazing by livestock and fencing can help to protect food plots, nesting cover, and fish habitat by providing streambank protection. Field borders and filter strips along streams can help to protect the water quality and provide food, cover, and travel lanes for many species of wildlife. Selective thinning of woodland can be carried out in a manner that protects den and quality mast producing trees. Other practices that can improve wildlife habitat include wildlife upland habitat management, wildlife wetland habitat management, fishpond management, pasture and hayland management, livestock exclusion, and woodland improvement.

Some practices are harmful to wildlife. Those practices most often include indiscriminate burning, applying pesticides, heavy grazing, mowing during the growing (nesting) season, clean fall plowing, extensive clearcutting of timber, draining and clearing wetlands, and removing den and all mast producing trees.

Technical assistance in the planning or application of wildlife conservation practices can be obtained from the Natural Resources Conservation Service, the University of Tennessee Agricultural Extension Service, the Tennessee Wildlife Resources Agency, and the Tennessee Division of Forestry.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the

amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 10, 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 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, and soybeans.

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, orchardgrass, annual lespedeza, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, common ragweed, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, shrub lespedeza, shrub honeysuckle, 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 eastern redcedar.

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and soil moisture. Examples of shrubs are mountainmahogany, bitterbrush, snowberry, and big sagebrush.

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, cattails, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these

areas include bobwhite quail, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous and/or coniferous plants and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, otter, and beaver.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 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 particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, 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 kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 11 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, or 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, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the

susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, 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 or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action 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, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 12 shows the degree and 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.

The table 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 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, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere 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 and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

The table 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, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans 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 the table are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium 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 is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to wind erosion.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a fragipan, or the water table to permit revegetation. The soil material used as the 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 13 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are 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. They may 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 the table, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, 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, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, 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 low in content of soluble salts, 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, stones, or soluble salts, 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, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect 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.

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 even 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, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, a cemented pan, or 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; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, and sulfur. Availability of drainage outlets is not considered in the ratings.

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 the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind erosion or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, 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.

Soil properties are ascertained by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. 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 particle-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 are shown in tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

Engineering Index Properties

Table 15 gives the engineering classifications and the range of index properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages 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 15 percent or more, 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 (ASTM 1998) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO 1998).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

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 particle-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 larger than 10 inches in diameter and 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.

The estimates of particle-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is generally omitted in the table.

Physical Properties

Table 16 shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In table 16, the estimated clay content of each 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 affect the fertility and physical condition of the soil and 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 $^1/_3$- or $^1/_{10}$-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each 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. Depending on soil texture, a bulk density of more than 1.4 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 (K_{sat}) refers to the ability of a soil to transmit water or air. The term "permeability," as used in soil surveys, indicates saturated hydraulic conductivity (K_{sat}). The estimates in the table indicate the rate of water movement, in inches per hour, 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 is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 16, 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 by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in table 16 as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of several factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Chemical Properties

Table 17 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable bases 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. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Effective cation-exchange capacity refers to the sum of extractable bases plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil 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.

Soil Features

Table 18 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes 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 or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete 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 amount of sulfates in the saturation extract.

Water Features

Table 19 gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, 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, 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 or 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 high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. Table 19 indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are 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.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (USDA 1998 and 1999). 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 from laboratory measurements. Table 20 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Twelve 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 Alfisol.

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 Udalf (*Ud*, meaning humid, plus *alf*, from Alfisol).

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; type of saturation; 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 Hapludalfs (*Hapl*, meaning minimal horizonation, plus *udalf*, the suborder of the Alfisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup 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 taxonomic class. 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 Hapludalfs.

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, mineral content, soil temperature regime, soil depth, and reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine, mixed, semiactive, thermic Typic Hapludalfs.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. 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 detailed description of each soil horizon follows standards in the "Soil Survey Manual" (USDA 1993). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (USDA 1999) and in "Keys to Soil Taxonomy" (USDA 1998). Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

Armour Series

The Armour series consists of very deep, well drained soils on stream terraces along the Cumberland River and its major tributaries. These soils formed in alluvium or valley fill. Slopes range from 2 to 12 percent.

A typical pedon of Armour silt loam, 2 to 5 percent slopes; 1 mile east of the intersection of Tennessee Highway 53 and Tennessee Highway 135; about 125 feet north of Tennessee Highway 135; in the

Roaring River Recreation Area, in a pasture; USGS Dodson Branch quadrangle.

Ap—0 to 9 inches; brown (10YR 4/3) silt loam; common fine distinct pale brown (10YR 6/3) mottles; weak fine granular structure; very friable; many fine and very fine and few coarse and very coarse roots; few rounded quartz pebbles; moderately acid; gradual smooth boundary.

BA—9 to 13 inches; dark yellowish brown (10YR 4/4) silt loam; common fine and medium distinct pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; very friable; common fine and very fine and few coarse and very coarse roots; few rounded quartz pebbles; moderately acid; clear smooth boundary.

Bt1—13 to 18 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable; common fine and very fine and few coarse and very coarse roots; many fine and very fine pores; common faint dark yellowish brown (10YR 4/6) clay films on faces of peds and in pores; few fine black manganese concretions; few rounded quartz pebbles; moderately acid; clear smooth boundary.

Bt2—18 to 23 inches; dark yellowish brown (10YR 4/6) silty clay loam; few fine distinct light yellowish brown (10YR 6/4) mottles; moderate medium subangular blocky structure; friable; common fine and very fine and few coarse and very coarse roots; many fine and very fine pores; common distinct dark yellowish brown (10YR 3/6) clay films on faces of peds and in pores; many fine black manganese concretions; few rounded quartz pebbles; strongly acid; gradual smooth boundary.

Bt3—23 to 41 inches; strong brown (7.5YR 5/6) silty clay loam; common fine distinct brownish yellow (10YR 6/6) and common fine prominent yellowish red (5YR 5/8) and light yellowish brown (10YR 6/4) mottles; moderate medium subangular blocky structure; friable; few fine and very fine roots; many fine and very fine and few coarse pores; common faint strong brown (7.5YR 4/6) clay films on faces of peds and in pores; many fine black manganese concretions; few rounded quartz pebbles; strongly acid; gradual wavy boundary.

Bt4—41 to 80 inches; strong brown (7.5YR 5/6) silty clay loam; common fine and medium distinct brownish yellow (10YR 6/6) and common fine and medium strong brown (7.5YR 5/8) and reddish yellow (5YR 5/6) mottles; moderate medium subangular blocky structure; friable; few fine roots; many fine and very fine and few coarse pores; common faint strong brown (7.5YR 4/6) clay films on faces of peds and in pores; approximately 10 percent, by volume, angular chert fragments and rounded quartz pebbles; many fine black manganese concretions and nodules; strongly acid; gradual wavy boundary.

The depth to bedrock is more than 60 inches. The content of rounded pebbles or chert fragments ranges from 0 to 10 percent in the A and Bt horizons and from 0 to 35 percent in the C horizon, if it occurs.

Reaction is moderately acid or strongly acid, except where lime has been added.

The Ap horizon has hue of 10YR, value of 4, and chroma of 2 to 4. Texture is silt loam.

Some pedons have a transitional horizon between the Ap and Bt horizons.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. Texture is silty clay loam or silt loam. In some pedons this horizon has few or common mottles in shades of brown, yellow, and red.

Some pedons have a C horizon below a depth of 60 inches. The horizon has colors and textures similar to those of the Bt horizon.

Arrington Series

The Arrington series consists of very deep, well drained soils on flood plains along the Cumberland River and its major tributaries. These soils formed in silty alluvium. Slopes range from 0 to 2 percent.

A typical pedon of Arrington silt loam, occasionally flooded; 7.5 miles northwest of the intersection of State Highway 56 and State Highway 85; about 4.9 miles west of the intersection of State Highway 135 and State Highway 56; about 0.1 mile south of the intersection of State Highway 56 and Hunting Creek Road; 433 feet east of Hunting Creek Road, in a hayfield; USGS Whitleyville quadrangle.

Ap—0 to 10 inches; dark brown (10YR 3/3) silt loam; weak medium granular structure; very friable; many fine and very fine roots; approximately 5 percent, by volume, angular fragments of chert; slightly acid; gradual smooth boundary.

A—10 to 37 inches; dark brown (10YR 3/3) silt loam; common fine and medium faint brown (10YR 4/3) mottles; moderate medium granular structure; very friable; many fine roots; few fine pores; slightly acid; gradual wavy boundary.

Bw—37 to 55 inches; dark yellowish brown (10YR 4/4) silty clay loam; many fine and medium distinct brown (10YR 4/3) and few fine faint yellowish brown (10YR 5/4) mottles; moderate medium subangular blocky structure; friable; common fine and very fine roots; common fine and very fine pores; slightly acid; clear smooth boundary.

C—55 to 80 inches; yellowish brown (10YR 5/4) silt loam; massive; friable; few fine black manganese concretions; slightly acid.

The depth to bedrock is more than 60 inches. Reaction is slightly acid or neutral. The content of coarse fragments ranges from 0 to 5 percent in the A and Bw horizons and from 0 to 15 percent in the C horizon.

The A horizon has hue of 10YR and value and chroma of 3. Texture is silt loam.

The Bw horizon has hue of 10YR and value and chroma of 3 or 4. Texture is silt loam or silty clay loam.

The C horizon, if it occurs, has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is silt loam or silty clay loam.

Barfield Series

The Barfield series consists of shallow, well drained soils on hillsides on uplands in the outer part of the Central Basin region. These soils formed in limestone residuum. Slopes range from 5 to 70 percent.

A typical pedon of Barfield silty clay, in an area of Barfield-Gladdice-Rock outcrop complex, 20 to 70 percent slopes; 0.5 mile southeast of Gladdice on Smith Bend Road; 1,075 feet northeast of Smith Bend Road, on a hillside in a wooded area.

A—0 to 4 inches; very dark grayish brown (10YR 3/2) silty clay; moderate fine and medium granular structure; friable; many fine and coarse roots; approximately 10 percent thin limestone channers and a few flagstones; slightly acid; gradual smooth boundary.

Bw1—4 to 11 inches; dark brown (10YR 3/3) clay; common fine and medium faint brown (10YR 4/3) mottles; moderate medium and coarse subangular blocky structure; firm; common fine and coarse roots; approximately 5 percent thin limestone channers; slightly acid; clear wavy boundary.

Bw2—11 to 18 inches; brown (10YR 4/3) clay; common fine and medium distinct dark yellowish brown (10YR 4/4) and brown (10YR 4/6) mottles; moderate medium and coarse subangular blocky structure; firm; few fine and medium roots; approximately 5 percent thin limestone channers; neutral; abrupt smooth boundary.

R—18 inches; limestone bedrock.

The depth to limestone bedrock ranges from 8 to 20 inches. The content of channers and flagstones of limestone and chert fragments ranges from 0 to 15 percent in the A horizon and from 5 to 25 percent in the Bw horizon. Reaction is slightly acid or neutral throughout the profile.

The A horizon has hue of 10YR, value of 3, and chroma of 2 or 3. Texture is silty clay loam or silty clay.

The Bw horizon dominantly has hue of 10YR and value and chroma of 3. In some pedons the lower part of the Bw horizon has hue of 10YR, value of 4, and chroma of 3. The number of mottles in shades of brown, yellow, red, olive, and gray ranges from none to common in the lower part of the Bw horizon. Texture of the Bw horizon is silty clay or clay.

The BC or C horizon, if it occurs, has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 to 6. The number of mottles in shades of brown, yellow, and gray ranges from few to many. Texture is silty clay or clay.

The R layer is hard limestone bedrock.

Bewleyville Series

The Bewleyville series consists of very deep, well drained soils on broad upland flats and ridgetops of the Highland Rim region. These soils formed in a silty mantle and the underlying clayey alluvium. Slopes range from 2 to 12 percent.

A typical pedon of Bewleyville silt loam, 2 to 5 percent slopes, eroded; 0.7 mile east of the intersection of Dodson Branch Road and Willis Martin Road; 0.4 mile east of the intersection of Dodson Branch Road and Smith Chapel Road; 0.1 mile east of the intersection of Dodson Branch Road and Norman Mayberry Road; 1,691 feet south of Dodson Branch Road, in a field; USGS Windle quadrangle.

Ap—0 to 6 inches; yellowish brown (10YR 5/4) silt loam; few medium prominent strong brown (7.5YR 5/6) and yellowish red (5YR 5/6) mottles; weak fine granular structure; very friable; many very fine roots; moderately acid; clear smooth boundary.

Bt1—6 to 26 inches; strong brown (7.5YR 5/6) silty clay loam; few medium distinct red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; friable; common very fine roots; few faint strong brown (7.5YR 4/6) clay films on faces of peds; common fine black manganese concretions; strongly acid; clear wavy boundary.

2Bt2—26 to 45 inches; red (2.5YR 4/6) clay; few medium prominent strong brown (7.5YR 5/8) and reddish brown (5YR 5/3) mottles; moderate medium subangular blocky structure; friable; few very fine roots; few fine distinct dark red (2.5YR 3/6) clay films on faces of peds; common fine black manganese concretions; strongly acid; gradual smooth boundary.

2Bt3—45 to 80 inches; red (2.5YR 4/8) clay; many medium distinct strong brown (7.5YR 5/8) and

many medium prominent pinkish gray (7.5YR 7/2) and reddish brown (5YR 5/3) mottles; moderate medium subangular blocky structure; friable; few fine distinct red (2.5YR 4/6) clay films on faces of peds; strongly acid.

Depth to limestone bedrock is more than 6 feet. Reaction is moderately acid or strongly acid, except where lime has been added.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. It is mottled in shades of brown and red in some pedons. Texture is silt loam.

The Bt horizon has hue of 7.5YR, 5YR, or 2.5YR, value of 4 or 5, and chroma of 6 or 8. It is mottled in shades of brown and red. Texture is silty clay loam.

The 2Bt horizon has hue of 2.5YR or 10R, value of 4, and chroma of 6 or 8. It is mottled in shades of brown and gray. Texture is clay.

Christian Series

The Christian Series consists of very deep, well drained soils on uplands of the Highland Rim region. These soils formed in fine textured residuum derived from interbedded limestone, sandstone, siltstone, and shale. Slopes range from 2 to 20 percent.

A typical pedon of Christian silt loam, 5 to 12 percent slopes, eroded; 0.7 mile south of the intersection of Cummins Mill Road and Lester Fox Road; 0.2 mile south of the intersection of Lester Fox Road and Montgomery Road; 0.6 mile northeast of the intersection of Lester Fox Road and State Highway 290; about 164 feet west of Lester Fox Road, in a pasture; USGS Cookeville West quadrangle.

Ap—0 to 7 inches; yellowish brown (10YR 5/4) silt loam; few medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; few very fine roots; moderately acid; clear smooth boundary.

Bt1—7 to 17 inches; yellowish red (5YR 5/8) silty clay loam; moderate medium subangular blocky structure; firm; few very fine roots; common prominent yellowish red (5YR 4/6) clay films on faces of peds; strongly acid; clear smooth boundary.

Bt2—17 to 42 inches; yellowish red (5YR 5/6) silty clay; many medium prominent red (2.5YR 4/8), very pale brown (10YR 8/3), and brownish yellow (10YR 6/8) mottles; moderate medium subangular blocky structure; firm; few very fine roots; common fine pores; common distinct yellowish red (5YR 4/6) clay films on faces of peds; approximately 10 percent angular fragments of chert; strongly acid; clear smooth boundary.

Bt3—42 to 55 inches; red (2.5YR 4/8) silty clay; common medium prominent very pale brown (10YR 8/3), common medium distinct brownish yellow (10YR 5/8), and common medium distinct dark red (2.5YR 3/6) mottles; moderate medium subangular blocky structure; very firm, moderately sticky, moderately plastic; few very fine roots; common prominent red (2.5YR 4/6) clay films on faces of peds; approximately 10 percent angular fragments of chert; very strongly acid; clear smooth boundary.

Bt4—55 to 61 inches; 35 percent yellow (10YR 7/8), 35 percent yellowish red (5YR 5/8), and 30 percent red (2.5YR 4/6) silty clay; moderate medium subangular blocky structure; very firm, moderately sticky, moderately plastic; few very fine roots; approximately 5 percent angular fragments of chert; very strongly acid.

BC—61 to 80 inches; mottled 35 percent red (2.5YR 4/6), 35 percent strong brown (7.5YR 5/8), and 30 percent reddish yellow (5YR 5/8) silty clay; weak coarse subangular and angular blocky structure; very firm, moderately sticky, moderately plastic; approximately 5 percent angular fragments of chert; very strongly acid.

The depth to bedrock ranges from 40 to more than 80 inches. The content of fragments ranges from 0 to about 10 percent in the A horizon and from 0 to 30 percent in the B and C horizons. Reaction is strongly acid or very strongly acid.

The A or Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. Texture is silt loam.

The Bt horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 4 to 8. It is mottled in shades of brown, red, or yellow. The number of mottles ranges from none to common. In some pedons this horizon does not have a dominant matrix color but has an evenly mottled pattern. Texture dominantly is silty clay, clay, or the gravelly analogs of those textures.

The BC or C horizon, if it occurs, has colors and textures similar to those of the Bt horizon.

Dellrose Series

The Dellrose series consists of very deep, well drained soils on hillsides, footslopes, and benches in the Central Basin region. These soils formed in gravelly colluvium. Slopes range from 5 to 60 percent.

A typical pedon of Dellrose gravelly silt loam, 20 to 45 percent slopes; 3.9 miles northwest of Whitleyville on State Highway 56; about 250 feet south of State Highway 56, on a hillside in a pasture; USGS Whitleyville quadrangle.

A—0 to 6 inches; dark brown (10YR 3/3) gravelly silt loam; weak fine granular structure; very friable; many fine roots; approximately 20 percent angular fragments of chert; moderately acid; gradual smooth boundary.

BA—6 to 15 inches; brown (10YR 4/3) gravelly silty clay loam; weak medium subangular blocky structure; friable; many fine roots; approximately 20 percent angular fragments of chert; moderately acid; abrupt smooth boundary.

Bt1—15 to 35 inches; dark yellowish brown (10YR 4/4) gravelly silty clay loam; moderate medium and coarse subangular blocky structure; friable; few fine roots; common distinct dark yellowish brown (10YR 4/6) clay films on faces of peds, coating fragments, and in pores; approximately 35 percent angular fragments of chert and a few cobbles; moderately acid; clear wavy boundary.

Bt2—35 to 52 inches; dark yellowish brown (10YR 4/4) gravelly silty clay loam; moderate medium and coarse subangular blocky structure; friable; many distinct dark yellowish brown (10YR 4/6) clay films on faces of peds, coating fragments, and in pores; approximately 30 percent fragments of chert and a few cobbles; moderately acid; clear wavy boundary.

Bt3—52 to 63 inches; dark yellowish brown (10YR 4/4) very gravelly silty clay loam; moderate medium subangular blocky structure; firm; few distinct dark yellowish brown (10YR 4/6) clay films on faces of peds; approximately 50 percent angular fragments of chert; moderately acid; gradual wavy boundary.

2Bt4—63 to 80 inches; dark yellowish brown (10YR 4/6) silty clay; common medium distinct dark yellowish brown (10YR 4/4) and common medium faint yellowish brown (10YR 5/6) mottles; strong coarse subangular blocky structure; approximately 10 percent angular fragments of chert; moderately acid.

The depth to rock is more than 60 inches. The content of fragments ranges from 15 to 35 percent in the A horizon and the upper part of the Bt horizon, from 35 to 50 percent in the lower part of the Bt horizon, and from 0 to 15 percent in the 2Bt horizon. Channers of weathered shale are in some pedons. Reaction is strongly acid or moderately acid, except where lime has been added.

The A horizon has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 2 to 4. The texture of the fine-earth fraction is silt loam.

The Bt horizon and BA horizon, if it occurs, have hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8. Some pedons have few to common mottles in shades of brown, yellow, and red. Texture of the fine-earth fraction is silt loam or silty clay loam.

The 2Bt horizon has the same colors as those of the Bt horizon. Texture is silty clay, clay, or silty clay loam.

Dickson Series

The Dickson series consists of very deep, moderately well drained soils on undulating uplands in the Highland Rim region. These soils formed in a silty mantle and the underlying limestone residuum. They have a fragipan in the subsoil. Slopes range from 2 to 8 percent.

A typical pedon of Dickson silt loam, 2 to 5 percent slopes, eroded; 1.0 mile northeast of the intersection of Blue Ridge Road and Step Rock Hill Road; 0.6 mile north of the intersection of Hardscrabble Road and Step Rock Hill Road; 0.4 mile northwest of the intersection of Zenith Allen Road and Step Rock Hill Road; 0.3 mile northwest of the intersection of Phillips Ridge Road and Step Rock Hill Road; 156 feet east of Phillips Ridge Road, in a field; USGS Dodson Branch quadrangle.

Ap—0 to 11 inches; yellowish brown (10YR 5/4) silt loam; few fine faint olive brown (2.5Y 4/4) mottles; weak fine granular structure; very friable; many fine and very fine roots; approximately 5 percent angular fragments of chert; slightly acid; clear smooth boundary.

Bt—11 to 22 inches; light olive brown (2.5Y 5/4) silty clay loam; moderate medium subangular blocky structure; friable; few fine and very fine roots; few faint light olive brown (2.5Y 5/6) clay films on faces of peds; common medium distinct yellowish brown (10YR 5/8) and common medium prominent strong brown (7.5YR 5/8) iron concentrations; moderately acid; clear wavy boundary.

B/E—22 to 25 inches; B part (60 percent of horizon): light yellowish brown (10YR 6/4) silty clay loam; moderate medium subangular blocky structure; firm; E part (remaining 40 precent): light gray (10YR 7/2), brownish yellow (10YR 6/6), and light brownish gray (10YR 6/2) silt loam; weak fine subangular blocky structure; very friable; few fine roots; common fine black manganese concretions; brittle in approximately 40 percent of the mass; strongly acid; clear wavy boundary.

Btx—25 to 51 inches; yellowish brown (10YR 6/6) silty clay loam; common medium distinct light yellowish brown (10YR 6/4) and common medium prominent strong brown (7.5YR 5/8) mottles; weak very coarse prismatic structure parting to

moderate medium subangular blocky; very firm; few very fine roots in vertical seams; few distinct yellowish brown (10YR 5/6) clay films on faces of prisms along vertical seams; common light brownish gray (10YR 6/2) and light gray (10YR 7/1) iron and clay depletions in vertical seams between prisms; common fine black manganese concretions; brittle in approximately 75 percent of the mass; strongly acid; abrupt wavy boundary.

2Bt—51 to 66 inches; red (2.5YR 4/6) gravelly clay; moderate medium angular and subangular blocky structure; firm; common distinct red (10R 4/6) clay films on faces of peds; approximately 35 percent angular fragments of chert; strongly acid.

The depth to bedrock is more than 5 feet. Depth to the fragipan ranges from 20 to 36 inches. The content of coarse fragments ranges from 0 to 10 percent in the lower part of the Btx horizon and from 0 to 35 percent in the 2Bt horizon. Reaction is strongly acid or moderately acid, except where lime has been added.

The A or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is silt loam.

The Bt or Bw horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 or 6. Texture is silt loam or silty clay loam.

In the B/E horizon, the B part has hue of 2.5Y or 10YR, value of 5 or 6, and chroma of 4 or 6. Texture is silt loam or silty clay loam. The E part has hue of 10YR, value of 5 to 7, and chroma of 3 or less. Texture is silt loam.

The Btx horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 3 to 6. The number of redox features, such as iron and clay depletions, silt coatings, and iron concentrations, ranges from common to many. Texture is silt loam or silty clay loam.

The 2Bt horizon has hue of 7.5YR, 5YR, or 2.5YR, value of 4 or 5, and chroma of 4 to 8. The number of iron depletions and concentrations is few or common in the upper part of the horizon. The texture of the fine-earth fraction in the horizon is silty clay loam, silty clay, or clay.

Gladdice Series

The Gladdice series consists of moderately deep, well drained soils on upland hillsides in the outer part of the Central Basin region. These soils formed in residuum weathered from limestone. Slopes range from 15 to 45 percent.

A typical pedon of Gladdice silty clay loam, in an area of Barfield-Gladdice-Rock outcrop complex, 20 to 70 percent slopes; 0.8 mile east of the intersection of State Highway 85 and State Highway 262 at Highland; 400 feet south of State Highway 85, in a pasture; USGS Granville quadrangle.

A—0 to 6 inches; brown (10YR 4/3) silty clay loam; weak fine and medium granular structure; very friable; many fine and medium roots; approximately 5 percent limestone channers; slightly acid; clear smooth boundary.

Bt1—6 to 13 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; many fine roots; few distinct dark yellowish brown (10YR 4/6) clay films on faces of peds; approximately 5 percent limestone channers; neutral; gradual smooth boundary.

Bt2—13 to 18 inches; dark yellowish brown (10YR 4/4) clay; strong medium subangular and angular blocky structure; firm; few fine roots; many distinct dark yellowish brown (10YR 4/6) clay films on faces of peds; neutral; abrupt wavy boundary.

Btss3—18 to 27 inches; yellowish brown (10YR 5/6) clay; many fine distinct yellowish brown (10YR 5/8 and 5/4) mottles; strong coarse and very coarse subangular and angular blocky structure; very firm; few fine roots; few prominent dark yellowish brown (10YR 4/6) nonintersecting slickensides and pressure faces; many prominent yellowish brown (10YR 5/4) clay films on faces of peds; many fine black manganese concretions and nodules; neutral; abrupt smooth boundary.

C—27 to 30 inches; light olive brown (2.5Y 5/4) clay; many fine prominent yellowish brown (10YR 5/6) and strong brown (7.5YR 5/8) and many fine distinct olive yellow (2.5Y 6/6) mottles; massive; very firm; many fine black manganese concretions and nodules; neutral; abrupt smooth boundary.

R—30 inches; hard limestone bedrock.

The depth to bedrock ranges from 20 to 40 inches. The content of channers and flagstones of limestone and chert ranges from 0 to 15 percent in all horizons. Reaction is slightly acid or neutral.

The A horizon has hue of 10YR, value of 4, and chroma of 2 to 4. Texture is silt loam or silty clay loam.

The Bt horizon has hue of 10YR, value of 4 to 6, and chroma of 3 to 6. In some pedons the lower part of this horizon is mottled in shades of brown, yellow, olive, and gray. The number of pressure faces and slickensides ranges from none to common. Texture is silty clay, clay, and silty clay loam.

The BC and C horizons, if they occur, have hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 4 or 6. The number of mottles in shades of brown, olive, yellow, and gray ranges from none to common. Texture is clay or silty clay.

The R layer is hard limestone bedrock.

Hawthorne Series

The Hawthorne series consists of moderately deep, somewhat excessively drained soils on narrow, rolling ridgetops and steep, extremely dissected hillsides of the Highland Rim region. These soils formed in residuum derived from interbedded siltstone and limestone. Slopes range from 5 to 70 percent.

A typical pedon of Hawthorne gravelly silt loam, 5 to 20 percent slopes; 3.8 miles north of the intersection of State Highway 56 and State Highway 135 at Whitleyville; 1,800 feet southeast of State Highway 135, on a narrow ridgetop in a wooded area; USGS Whitleyville quadrangle.

A—0 to 2 inches; brown (10YR 4/3) gravelly silt loam; weak fine granular structure; very friable; many fine and medium and common coarse roots; many very fine and fine pores; approximately 20 percent angular fragments of chert and highly weathered siltstone channers; moderately acid; abrupt smooth boundary.

E—2 to 4 inches; brown (10YR 5/3) gravelly silt loam; weak medium granular structure; friable; many fine and medium and common coarse roots; many very fine and fine pores; approximately 20 percent angular fragments of chert and siltstone channers; strongly acid; gradual smooth boundary.

Bw1—4 to 12 inches; yellowish brown (10YR 5/4) very channery silt loam; few fine distinct brownish yellow (10YR 6/6) and few fine distinct pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; friable; common fine and medium and few coarse roots; common fine pores; approximately 40 percent siltstone channers and angular fragments of chert; very strongly acid; clear smooth boundary.

Bw2—12 to 23 inches; brownish yellow (10YR 6/6) very channery silt loam; few medium distinct yellowish brown (10YR 5/4) and few fine faint yellowish brown (10YR 5/6) mottles; weak fine and medium platy structure; friable; few fine and medium roots between and surrounding channers and angular fragments of chert; common fine pores; approximately 60 percent siltstone channers and angular fragments of chert; very strongly acid; clear smooth boundary.

Cr—23 inches; alternating strata of highly weathered siltstone, thin seams of silty clay loam soil material, and hard, fractured chert beds less than 3 inches thick.

Depth to weathered bedrock commonly ranges between 20 and 30 inches but can extend to 40 inches. Hard bedrock is at a depth of more than 40 inches. The content of coarse fragments of angular chert and siltstone channers ranges from 15 to 35 percent in the A and E horizons and from 35 to 60 percent in the Bw and C horizons. Reaction ranges from extremely acid to strongly acid.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. Texture of the fine-earth fraction is silt loam.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. Texture of the fine-earth fraction is silt loam.

The Bw horizon has hue of 10YR or 7.5YR and value and chroma of 4 or 6. The number of mottles in shades of yellow, brown, or red ranges from none to common. Texture of the fine-earth fraction is silt loam or silty clay loam.

The C horizon, if it occurs, has the same colors and textures as those in the Bw horizon.

The Cr horizon is a mixture of interbedded highly weathered siltstone and hard, highly fractured chert interlayered with silty clay loam soil material. This horizon is highly variable in composition.

Holston Series

The Holston series consists of very deep, well drained soils on stream terraces along the Cumberland River. These soils formed in loamy alluvium or colluvium. Slopes range from 2 to 20 percent.

A typical pedon of Holston loam, 5 to 12 percent slopes, eroded; 2.6 miles northwest of the intersection of State Highway 262 and State Highway 53; about 1.3 miles northwest of the intersection of State Highway 262 and Free State Road; 1,000 feet west of Free State Road, in a cleared field; USGS Whitleyville quadrangle.

Ap—0 to 4 inches; brown (10YR 4/3) loam; few fine and medium prominent strong brown (7.5YR 4/6) mottles; weak fine and medium granular structure; very friable; many fine roots; strongly acid; clear smooth boundary.

AB—4 to 9 inches; brown (10YR 4/3) clay loam; common fine and medium prominent strong brown (7.5YR 5/6) mottles; weak medium granular structure; very friable; few fine roots; few rounded quartz pebbles; strongly acid; abrupt smooth boundary.

Bt1—9 to 17 inches; strong brown (7.5YR 5/6) clay loam; moderate medium subangular blocky structure; friable; few fine roots; common fine pores; many faint strong brown (7.5YR 4/6) clay films on faces of peds; few rounded quartz pebbles; neutral; clear wavy boundary.

Bt2—17 to 37 inches; strong brown (7.5YR 5/6) clay loam; many fine and medium distinct strong brown (7.5YR 5/8) and common fine and medium distinct yellowish brown (10YR 5/6) mottles; weak medium and coarse subangular blocky structure; friable; few fine roots; common fine pores; many faint strong brown (7.5YR 4/6) clay films on faces of peds; many fine black manganese concretions and nodules; few rounded quartz pebbles; strongly acid; gradual wavy boundary.

Bt3—37 to 80 inches; strong brown (7.5YR 5/8) clay loam; common fine and medium prominent brownish yellow (10YR 6/6) and few medium prominent light yellowish brown (2.5Y 6/4) mottles; weak medium and coarse subangular blocky structure; friable; common medium and coarse pores; many distinct strong brown (7.5YR 4/6) clay films on faces of peds; many fine black manganese concretions and nodules; few rounded quartz pebbles; strongly acid.

The depth to bedrock is more than 60 inches. The content of fragments ranges from 0 to 15 percent throughout the profile. Reaction is very strongly acid or strongly acid, except where lime has been added.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is loam.

Some pedons have a transitional horizon between the A and Bt horizons.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 4 to 8. The number of mottles in shades of brown and red ranges from none to common. Texture dominantly is clay loam or loam, but in some rare instances, it includes sandy clay loam.

Humphreys Series

The Humphreys series consists of very deep, well drained soils on stream terraces and footslopes along tributaries of the Cumberland River. These soils formed in gravelly alluvium and colluvium. Slopes range from 2 to 12 percent.

A typical pedon of Humphreys gravelly silt loam, 5 to 12 percent slopes; 2.8 miles northwest of the intersection of State Highway 56 and Hunting Creek Road; 1.8 miles north of the intersection of State Highway 56 and Crabtree Creek Road; 500 feet west of Crabtree Creek Road, in a pasture; USGS Willette quadrangle.

Ap—0 to 5 inches; dark yellowish brown (10YR 3/4) gravelly silt loam; weak medium granular structure; very friable; many fine and very fine roots; approximately 15 percent fragments of chert, shale, and sandstone; moderately acid; gradual wavy boundary.

BA—5 to 17 inches; brown (10YR 4/3) gravelly silty clay loam; weak medium subangular blocky structure; friable; many fine and very fine roots; approximately 25 percent fragments of chert, shale, and sandstone; moderately acid; clear wavy boundary.

Bt1—17 to 35 inches; dark yellowish brown (10YR 4/4) gravelly clay loam; moderate fine and medium subangular blocky structure; friable; common fine and very fine roots; many fine and medium and few coarse pores; common distinct dark yellowish brown (10YR 4/6) clay films on faces of peds and coating fragments; approximately 35 percent fragments of chert, shale, and sandstone; moderately acid; clear smooth boundary.

Bt2—35 to 55 inches; dark yellowish brown (10YR 4/4) gravelly silty clay loam; moderate medium subangular blocky structure; friable; few fine and very fine roots; many fine and medium and few coarse pores; common distinct dark yellowish brown (10YR 4/6) clay films on faces of peds; approximately 30 percent fragments of chert, shale, and sandstone; strongly acid; gradual wavy boundary.

C—55 to 80 inches; yellowish brown (10YR 5/4) very gravelly silty clay loam; massive; very friable; approximately 60 percent fragments of chert, shale, and sandstone; strongly acid.

The depth to bedrock is more than 60 inches. The content of coarse fragments ranges from 15 to 35 percent in the A and Bt horizons and from 15 to 60 percent in the C horizon. Reaction ranges from very strongly acid to moderately acid, except where lime has been added.

The A horizon has hue of 10YR, value of 3, and chroma of 3 or 4. Many Ap horizons have hue of 10YR, value of 4, and chroma of 3 or 4. Texture of the fine-earth fraction is silt loam or loam.

Many pedons have a transitional horizon between the A and Bt horizons.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 or 6. In some pedons the lower part of this horizon below a depth of 40 inches has redox features in shades of brown or gray. Texture of the fine-earth fraction is silty clay loam, loam, or clay loam.

The C horizon has the same range of colors as that in the Bt horizon. Texture of the fine-earth fraction is silty clay loam, clay loam, or silt loam.

Lindside Series

The Lindside series consists of very deep, moderately well drained soils on flood plains along the Cumberland River and its major tributaries. These soils formed in silty alluvium. Slopes range from 0 to 3 percent.

A typical pedon of Lindside silt loam, occasionally flooded; 0.3 mile north of the intersection of Holleman Bend Road and State Highway 53; about 1.9 miles south of the intersection of Holleman Bend Road and Billy Carter Road; 1.9 miles south of the intersection of Holleman Bend Road and N.B. Huff Road; 348 feet west of Holleman Bend Road, in a field; USGS Granville quadrangle.

Ap—0 to 12 inches; brown (10YR 4/3) silt loam; weak medium granular structure; friable; many very fine roots; slightly acid; clear wavy boundary.

Bw1—12 to 26 inches; dark yellowish brown (10YR 4/4) silty clay loam; common fine faint brown (10YR 4/3) mottles; weak medium subangular blocky structure; friable; common fine and very fine roots; common medium distinct light brownish gray (10YR 6/2) clay depletions and iron depletions (redox features) and common medium distinct yellowish brown (10YR 5/6) iron accumulations; neutral; clear wavy boundary.

Bw2—26 to 39 inches; brown (10YR 4/3) silty clay loam; moderate medium subangular blocky structure; friable; few fine and very fine roots; few fine black manganese concretions and nodules with diffuse edges; many medium and coarse distinct light brownish gray (10YR 6/2) clay depletions and iron depletions (redox features) and common medium distinct yellowish brown (10YR 5/6) iron accumulations; neutral; gradual wavy boundary.

BC—39 to 65 inches; dark yellowish brown (10YR 4/4) silty clay loam with thin strata of silt loam; moderate medium and coarse subangular blocky structure; few fine black manganese concretions with diffuse edges; many coarse distinct light brownish gray (10YR 6/2) clay depletions and iron depletions (redox features) and common medium distinct yellowish brown (10YR 5/8) and strong brown (7.5YR 5/8) iron accumulations; friable; neutral.

The depth to limestone bedrock is more than 60 inches. Reaction is slightly acid or neutral.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 3. Texture is silt loam, silty clay loam, or loam.

The Bw horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Redox features are in shades of brown, gray, and yellow. Texture is silt loam or silty clay loam.

The Bg horizon, if it occurs, has hue of 10YR, value of 5 or 6, and chroma of 2 or less. Redox features are in shades of gray, brown, and yellow. Texture is silt loam or silty clay loam.

The BC and BCg horizons, if they occur, have the same colors and textures as those in the Bw and Bg horizons.

Mimosa Series

The Mimosa series consists of deep, well drained soils on upland hillsides and footslopes in the outer part of the Central Basin region. These soils formed in fine textured limestone residuum. Slopes range from 2 to 20 percent.

A typical pedon of Mimosa silty clay loam, 5 to 12 percent slopes, eroded; 2.3 miles west of Gainesboro on State Highway 53; about 1.9 miles west of the intersection of State Highway 53 and State Highway 262; 300 feet north of State Highway 262, on a wooded side slope; USGS Gainsboro quadrangle.

A—0 to 5 inches; dark brown (10YR 3/3) silty clay loam; weak fine granular structure; friable; many fine and few medium roots; slightly acid; gradual smooth boundary.

BA—5 to 9 inches; brown (10YR 4/3) silty clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak fine and medium subangular blocky structure; friable; many fine and few medium roots; moderately acid; abrupt smooth boundary.

Bt1—9 to 17 inches; yellowish brown (10YR 5/6) clay; strong coarse and very coarse subangular blocky structure; firm, moderately sticky, moderately plastic; few fine roots; many distinct dark yellowish brown (10YR 4/6) clay films on faces of peds; many fine black manganese concretions and nodules; strongly acid; gradual smooth boundary.

Btss2—17 to 31 inches; yellowish brown (10YR 5/6) clay; strong coarse and very coarse subangular blocky structure; very firm, very sticky, very plastic; few fine roots; few prominent nonintersecting slickensides and pressure faces; many prominent dark yellowish brown (10YR 4/6) clay films on faces of peds; many fine black manganese concretions and nodules; moderately acid; gradual smooth boundary.

Bt3—31 to 42 inches; yellowish brown (10YR 5/6) clay; many medium distinct brown (10YR 5/3), many medium distinct yellowish brown (10YR 5/4), and many medium prominent light olive brown (2.5Y 5/4) mottles; strong coarse subangular blocky structure; very firm, very sticky, very plastic; many distinct dark yellowish brown (10YR 4/6) clay films on faces of peds; many fine black manganese concretions and nodules; neutral; abrupt smooth boundary.
R—42 inches; limestone bedrock.

The depth to bedrock ranges from 40 to 60 inches. The content of coarse fragments ranges from 0 to 20 percent in the A horizon and from 0 to 5 percent in the Bt horizon. Reaction ranges from very strongly acid to moderately acid, except where lime has been added. Reaction in the layer directly above the bedrock ranges from moderately acid to neutral.

The A or Ap horizon has hue of 10YR and value and chroma of 3 or 4. If value and chroma are 3, the surface horizon is less than 7 inches thick. Texture is silt loam or silty clay loam.

The BA horizon, if it occurs, has hue of 10YR, value of 4, and chroma of 3 or 4. Texture is silty clay loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8. In some pedons the lower part of this horizon has mottles in shades of brown, yellow, and olive. Texture is clay or silty clay.

The BC and C horizons, if they occur, have hue of 10YR or 2.5Y, value of 5, and chroma of 4 or 6. They have mottles in shades of brown, gray, and yellow. Texture is clay or silty clay.

The R layer is hard limestone bedrock.

Minter Series

The Minter series consists of deep, poorly drained soils on the flood plain along the Cumberland River. These soils formed in fine textured alluvium. Slopes range from 0 to 2 percent.

A typical pedon of Minter silt loam, occasionally flooded; 0.9 mile north of the intersection of Holleman Bend Road and State Highway 53; about 1.4 miles south of the intersection of Holleman Bend Road and Billy Carter Road; 1.4 miles south of the intersection of Holleman Bend Road and N.B. Huff Road, in a wooded area; USGS Granville quadrangle.

A—0 to 7 inches; dark grayish brown (2.5Y 4/2) silt loam; weak fine granular structure; very friable; many fine roots; moderately acid; clear smooth boundary.
Btg1—7 to 16 inches; gray (2.5Y 5/0) silty clay loam; weak fine and medium subangular blocky structure; friable; few fine roots; few fine black manganese concretions; strongly acid; gradual smooth boundary.
Btg2—16 to 22 inches; dark gray (2.5Y 4/0) silty clay; weak coarse subangular blocky structure; firm, moderately sticky, moderately plastic; common distinct olive (5Y 5/3 and 4/3) clay films on faces of peds and in root channels; moderately acid; gradual smooth boundary.
Btg3—22 to 29 inches; gray (2.5Y 5/0) silty clay; weak coarse subangular blocky structure; firm, moderately sticky, moderately plastic; many fine prominent light olive brown (2.5Y 5/4 and 5/6) clay films on faces of peds; common fine prominent yellowish brown (10YR 5/6 and 5/8) iron accumulations on faces of peds; strongly acid; clear wavy boundary.
Btg4—29 to 68 inches; gray (10YR 6/1) silty clay loam; moderate coarse and very coarse subangular blocky structure; firm, slightly sticky, slightly plastic; few distinct gray (10YR 5/1) clay films on faces of peds; many medium prominent yellowish brown (10YR 5/8) and strong brown (7.5YR 5/8) iron accumulations on faces of peds; strongly acid.

The depth to bedrock is more than 60 inches. Reaction is strongly acid or moderately acid in the A horizon and in the upper part of the Btg horizon. It ranges from strongly acid to neutral in the lower part of the Btg horizon and in the Cg horizon, if it occurs.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 or less. Texture is silt loam.

The Btg horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 2 or less. Some severely reduced pedons have gley hues of 5BG and 5GY. The number of iron accumulations in shades of brown and yellow ranges from none to common. Texture is silty clay loam, clay, and silty clay.

The Cg horizon, if it occurs, dominantly has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 2 or less. In some pedons it has hue of 5BG and 5GY. The number of iron accumulations in shades of brown, olive, and yellow ranges from few to many. Texture is silty clay loam or silt loam.

Mountview Series

The Mountview series consists of very deep, moderately well drained and well drained soils on undulating to rolling uplands of the Highland Rim region. These soils formed in a 2- to 3-foot silty mantle and the underlying limestone residuum. Slopes range from 2 to 12 percent.

A typical pedon of Mountview silt loam, 2 to 5 percent slopes, eroded; 0.7 mile southwest of the

intersection of Garrison Road and State Highway 135; about 0.3 mile northeast of the intersection of Garrison Road and Hill Road; 970 feet north of Garrison Road, in a field; USGS Dodson Branch quadrangle.

Ap—0 to 2 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; many very fine and few fine roots; many very fine pores; moderately acid; clear smooth boundary.

E—2 to 8 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct brown (10YR 4/3) mottles; weak medium granular structure; very friable; common very fine and fine roots; many very fine pores; moderately acid; abrupt wavy boundary.

Bt1—8 to 18 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; common very fine and fine roots; few faint dark yellowish brown (10YR 4/6) clay films on faces of peds; strongly acid; clear wavy boundary.

Bt2—18 to 29 inches; strong brown (7.5YR 5/6) silty clay loam; many medium distinct yellowish red (5YR 4/6) and many medium prominent red (2.5YR 4/8) mottles; moderate medium subangular blocky structure; friable; few very fine and fine roots; common distinct strong brown (7.5YR 4/6) clay films on faces of peds; many fine black manganese concretions and nodules; strongly acid; gradual wavy boundary.

2Bt/E—29 to 39 inches; Bt part: strong brown (7.5YR 4/6) silty clay loam; weak coarse subangular blocky structure; firm; E part: pale brown (10YR 6/3) silt loam; weak fine and medium subangular blocky structure; friable; few very fine roots; many distinct yellowish red (5YR 4/6) clay films on faces of peds and in root channels; many medium prominent red (2.5YR 4/8) iron accumulations on faces of peds; common fine prominent light brownish gray (10YR 6/2) depletions on faces of peds; many fine black manganese stains; brittle in approximately 20 percent of the mass; approximately 10 percent angular fragments of chert; strongly acid; abrupt wavy boundary.

2Bt—39 to 80 inches; red (2.5YR 4/6) silty clay; moderate medium subangular and angular blocky structure; firm; few pale brown (10YR 6/3) and brownish yellowish (10YR 6/6) pockets of silt loam; many distinct strong brown (7.5YR 5/6) clay films in root channels and dark red (2.5YR 3/6) clay films on faces of peds; approximately 10 percent angular fragments of chert; strongly acid.

The depth to bedrock is more than 60 inches. The content of coarse fragments ranges from 0 to 10 percent in the upper 30 inches of the profile and from 0 to about 25 percent below that depth. Reaction is strongly acid or very strongly acid, except where lime has been added.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is silt loam.

The E horizon, if it occurs, has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. Texture is silt loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. The texture is silt loam or silty clay loam.

The Bt part of the 2Bt/E horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. The texture is silt loam or silty clay loam. The E part has hue of 10YR, value of 6 or 7, and chroma of 2 to 4. Pedons have few or common redox depletions in shades of gray and brown. The texture is silt loam. The horizon is brittle in 10 to 40 percent of the mass.

The 2Bt horizon has hue of 7.5YR, 5YR, or 2.5YR, value of 4 or 5, and chroma of 4 to 8. The number of mottles in shades of yellow, red, and brown ranges from few to many. Some pedons do not have a dominant matrix color but are mottled in shades of brown, yellow, and red. Some pedons have few or common redox iron depletions in the lower part. Texture of the fine-earth fraction is silty clay loam, silty clay, clay, or clay loam.

Ocana Series

The Ocana series consists of very deep, well drained soils on narrow flood plains. These soils formed in gravelly alluvium. Slopes range from 0 to 3 percent.

A typical pedon of Ocana gravelly silt loam, occasionally flooded; 0.5 mile west of North Springs; 1.1 miles southeast of the intersection of Long Hollow Road and Hudson Creek Road; 0.3 mile northwest of the intersection of Tennessee Highway 56 and Hudson Creek Road; 400 feet northeast of Hudson Creek Road, in a pasture; USGS Willette quadrangle.

Ap—0 to 7 inches; brown (10YR 4/3) gravelly silt loam; weak fine granular structure; very friable; many very fine and few fine roots; approximately 15 percent rounded pebbles; slightly acid; clear smooth boundary.

Bw1—7 to 17 inches; brown (10YR 4/3) gravelly silt loam; weak fine and medium subangular blocky structure; very friable; common fine roots; approximately 20 percent rounded pebbles; slightly acid; clear wavy boundary.

Bw2—17 to 36 inches; dark yellowish brown (10YR 4/4) gravelly loam; weak medium subangular blocky structure; friable; few very fine roots; approximately 20 percent rounded pebbles; slightly acid; clear wavy boundary.
Bw3—36 to 48 inches; dark yellowish brown (10YR 4/4) gravelly clay loam; weak medium subangular blocky structure; friable; approximately 30 percent rounded pebbles and gravel; slightly acid; gradual wavy boundary.
C—48 to 65 inches; brown (10YR 4/3) very gravelly loam; weak medium and fine subangular blocky structure; friable; approximately 50 percent rounded pebbles and 5 percent cobbles; neutral.

The depth to bedrock is more than 40 inches. The content of coarse fragments ranges from 15 to 35 percent in the A and Bw horizons and from 35 to 85 percent in the C horizon. Reaction ranges from moderately acid to neutral.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is gravelly silt loam or gravelly loam.

The Bw horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. The number of mottles in shades of brown ranges from none to common. Texture of the fine-earth fraction is silt loam, loam, or clay loam.

The C horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. The number of mottles in shades of brown ranges from none to common. Some pedons have redox depletions in shades of gray. Texture of the fine-earth fraction is silt loam, loam, clay loam, or sandy loam.

Skidmore Series

The Skidmore series consists of very deep, well drained soils on narrow flood plains along small tributaries of the Cumberland River. These soils formed in gravelly alluvium. Slopes range from 0 to 3 percent.

A typical pedon of Skidmore gravelly loam, occasionally flooded; 2.2 miles northwest of the intersection of State Highway 151 and State Highway 56; about 3.6 miles north of the intersection of State Highway 56 and Ward Fork Road; 2.5 miles northwest of the intersection of State Highway 56 and Crabtree Creek Road; 221 feet east of State Highway 151, in a pasture; USGS Willette quadrangle.

Ap—0 to 10 inches; brown (10YR 4/3) gravelly loam; moderate medium granular structure; very friable; many very fine and few fine roots; approximately 35 percent rounded gravel; slightly acid; clear wavy boundary.
Bw1—10 to 19 inches; brown (10YR 4/3) very gravelly coarse sandy loam; moderate medium granular structure; very friable; common very fine roots; approximately 50 percent rounded gravel; slightly acid; clear wavy boundary.
Bw2—19 to 24 inches; brown (10YR 4/3) very gravelly clay loam; weak medium subangular blocky structure; friable; few very fine roots; approximately 45 percent gravel; slightly acid; clear wavy boundary.
CB—24 to 32 inches; brown (10YR 4/3) extremely gravelly clay loam; weak medium subangular blocky structure; friable; approximately 70 percent gravel; slightly acid; gradual wavy boundary.
C1—32 to 48 inches; brown (10YR 4/3) extremely gravelly coarse sandy loam; massive; very friable; approximately 70 percent gravel; neutral; gradual wavy boundary.
C2—48 to 65 inches; dark yellowish brown (10YR 4/4) extremely gravelly coarse sandy loam; massive; very friable; approximately 70 percent gravel; neutral.

The depth to bedrock is more than 60 inches. The content of coarse fragments ranges from 15 to 50 percent in the A and Bw horizons and from 35 to 85 percent in the C horizon. Reaction ranges from slightly acid to neutral.

The A or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is gravelly loam.

The Bw and C horizons have hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. The number of mottles in shades of brown ranges from none to common. Texture of the fine-earth fraction is clay loam, sandy loam, silty clay loam, sandy clay loam, loam, or coarse sandy loam.

Staser Series

The Staser series consists of very deep, well drained soils on flood plains along the Cumberland River and its major tributaries. These soils formed in loamy alluvium. Slopes range from 0 to 2 percent.

A typical pedon of Staser loam, occasionally flooded; 0.3 mile northwest of the intersection of State Highway 53 and State Highway 56; about 1.5 miles north of the intersection of State Highway 56 and State Highway 85; about 1,056 feet west of State Highway 56 and the Cumberland River bridge, in a field; USGS Whitleyville quadrangle.

Ap—0 to 7 inches; brown (10YR 4/3) loam; moderate medium granular structure; very friable; many fine roots; slightly acid; clear smooth boundary.
A—7 to 32 inches; dark brown (10YR 3/3) loam; weak fine subangular blocky and weak medium granular structure; friable; common fine roots; many fine and very fine pores; moderately acid; gradual smooth boundary.
Bw1—32 to 41 inches; brown (10YR 4/3) loam; weak fine subangular blocky structure; friable; few fine roots; few fine and very fine pores; moderately acid; gradual smooth boundary.
Bw2—41 to 51 inches; dark yellowish brown (10YR 4/4) loam; weak fine subangular blocky structure; friable; moderately acid; gradual smooth boundary.
C—51 to 80 inches; dark yellowish brown (10YR 4/4) fine sandy loam; massive; moderately acid.

Thickness of the mollic epipedon ranges from 24 to 40 inches. The depth to bedrock is more than 5 feet. Reaction is slightly acid or moderately acid.

The A horizon has hue of 10YR, value of 3, and chroma of 2 or 3. Most pedons have an Ap horizon, which is commonly 5 to 8 inches thick. The Ap horizon has hue of 10YR and value and chroma of 3 or 4. Texture is loam or fine sandy loam.

The Bw horizon has hue of 10YR and value and chroma of 3 or 4. In some pedons the lower part of the horizon has mottles in shades of brown and yellow. Texture is loam or fine sandy loam.

The C horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. Texture is loam or fine sandy loam.

Sugargrove Series

The Sugargrove series consists of moderately deep and deep, well drained soils on upland ridgetops and hillsides of the Highland Rim region. These soils formed in material weathered from interbedded limestone and siltstone. Slopes range from 5 to 20 percent.

A typical pedon of Sugargrove gravelly silt loam, 5 to 12 percent slopes, eroded; 0.7 mile west of the intersection of Haydenburg Ridge Road and Hix Hollow Road; 0.4 mile east of the intersection of Haydenburg Ridge Road and Skaggs Branch Road; 0.1 mile east of the intersection of Haydenburg Ridge Road and Indian Creek Road; 108 feet north of Haydenburg Ridge Road, in a pasture; USGS Willette quadrangle.

Ap—0 to 3 inches; brown (10YR 4/3) gravelly silt loam; few fine distinct yellowish brown (10YR 5/6) mottles; weak fine granular structure; very friable; many very fine roots; approximately 15 percent angular fragments of chert; neutral; clear smooth boundary.
E—3 to 12 inches; yellowish brown (10YR 5/4) gravelly silt loam; common fine distinct brownish yellow (10YR 6/6) mottles; weak fine granular structure; very friable; many very fine roots; approximately 15 percent angular fragments of chert; slightly acid; abrupt smooth boundary.
Bt—12 to 51 inches; brownish yellow (10YR 6/6) gravelly silty clay loam; many fine distinct brownish yellow (10YR 6/8) and many fine prominent reddish yellow (7.5YR 6/8) and strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; friable; common very fine roots; few faint yellowish brown (10YR 5/6) clay films on faces of peds and coating fragments; approximately 35 percent angular fragments of chert and siltstone channers; moderately acid; clear smooth boundary.
Cr—51 to 65 inches; highly fractured, horizontally bedded siltstone with thin strata of strong brown (7.5YR 5/8) silty clay loam between the beds; thin beds of angular chert fragments separate some rock layers.

The depth to hard bedrock is more than 60 inches. Depth to the Cr horizon ranges from 20 to 60 inches. The content of fragments ranges from 10 to 35 percent in the A and E horizons and from 15 to 35 percent in the Bt horizon. Reaction is strongly acid or very strongly acid, except where lime has been added.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is gravelly silt loam.

The E horizon, if it occurs, has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. Texture is gravelly silt loam.

The upper part of the Bt horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 or 6. The number of mottles in shades of brown and red ranges from few to common. Texture of the fine-earth fraction is silt loam or silty clay loam.

The lower part of the Bt horizon has hue of 10YR, 7.5YR, or 5YR, value of 4 to 6, and chroma of 4 to 8. The number of mottles in shades of yellow and red ranges from few to many. Texture of the fine-earth fraction is silty clay loam or clay.

The Cr horizon is horizontally bedded, highly fractured siltstone and cherty limestone interlayered with thin strata of silty clay loam.

Swafford Series

The Swafford series consists of very deep, moderately well drained soils on low stream terraces

along the Cumberland River and its major tributaries. These soils formed in loamy alluvium. Slopes range from 2 to 12 percent.

A typical pedon of Swafford loam, 2 to 5 percent slopes; 0.8 mile northwest of the intersection of Tennessee Highway 56 and Tennessee Highway 53; about 726 feet south of Tennessee Highway 56, in a pasture; USGS Whitleyville quadrangle.

Ap—0 to 9 inches; yellowish brown (10YR 5/4) loam; few medium prominent yellowish brown (10YR 5/8) mottles; weak fine and medium granular structure; very friable; many very fine and medium roots; moderately acid; abrupt wavy boundary.

Bt1—9 to 25 inches; yellowish brown (10YR 5/8) clay loam; few medium distinct yellowish brown (10YR 5/4), common fine and medium distinct strong brown (7.5YR 5/8), and common fine prominent yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; friable; many very fine and medium roots; few fine and medium pores; few faint yellowish brown (10YR 5/6) clay films on faces of peds and in pores; few fine black manganese nodules and concretions; moderately acid; gradual smooth boundary.

Bt2—25 to 35 inches; brownish yellow (10YR 6/8) clay loam; common fine and medium distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; friable; few fine and medium roots; common fine and medium pores; common faint yellowish brown (10YR 5/6) clay films on faces of peds and in pores; few fine black manganese nodules and concretions; common fine and medium light gray (10YR 7/2) iron depletions on faces of peds; common fine prominent yellowish red (5YR 5/8) iron accumulations on faces of peds; strongly acid; gradual wavy boundary.

Btx1—35 to 55 inches; brownish yellow (10YR 6/6) clay loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots in vertical seams; few distinct yellowish brown (10YR 5/6) clay films coating faces of prisms; common coarse prominent light brownish gray (2.5Y 6/2) iron and clay depletions as vertical seams between prisms; few fine black manganese nodules and concretions; brittle in about 40 to 50 percent of the mass; strongly acid; gradual wavy boundary.

Btx2—55 to 70 inches; light yellowish brown (10YR 6/4) clay loam; weak coarse prismatic structure parting to moderate medium subangular blocky structure; firm; many fine and medium pores; common fine distinct yellowish brown (10YR 5/4) clay films coating prism faces; common coarse prominent light brownish gray (2.5Y 6/2) iron and clay depletions as vertical seams between prisms; common fine and medium prominent strong brown (7.5YR 5/8), yellowish red (5YR 5/8), and red (2.5YR 4/8) iron accumulations on faces of peds; many fine and medium black manganese nodules and concretions; brittle in about 50 percent of the mass; strongly acid.

The depth to rock is more than 60 inches. Depth to a restrictive layer ranges from 20 to 36 inches. The content of fragments ranges from 0 to 25 percent throughout the pedon. Reaction is strongly acid or moderately acid, except where lime has been added.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 4 to 8. Redox features are within a depth of 30 inches from the surface. Texture is clay loam or loam.

The Btx horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. The number of redox depletions and accumulations ranges from few to many. Texture of the fine-earth fraction is clay loam or loam.

Sykes Series

The Sykes series consists of very deep, well drained soils on footslopes and stream terraces. These soils formed in 2 to 4 feet of silty alluvium and the underlying fine textured residuum derived from limestone or interbedded limestone and shale. Slopes range from 2 to 12 percent.

A typical pedon of Sykes silt loam, 2 to 5 percent slopes, eroded; 1.5 miles southeast of the intersection of Salt Lick Creek Road and State Highway 85; about 0.9 mile northwest of the intersection of Brooks Bend Road and Salt Lick Creek Road; 0.6 mile northwest of the intersection of Herring Hollow Road and Brooks Bend Road; 320 feet north of Herring Hollow Road, in a field; USGS Granville quadrangle.

Ap—0 to 5 inches; brown (10YR 4/3) silt loam; common medium faint dark yellowish brown (10YR 4/4) and dark grayish brown (10YR 4/2) mottles; weak fine granular structure; friable; many fine and very fine roots; common fine pores; common fine black manganese concretions and nodules; moderately acid; clear wavy boundary.

Bt1—5 to 11 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak medium subangular blocky structure; friable; many fine and very fine roots; few fine pores; few faint dark yellowish brown (10YR 4/6) clay films on faces of peds; common

fine black manganese concretions and nodules; strongly acid; gradual wavy boundary.

Bt2—11 to 24 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable; many fine and very fine roots; many fine pores; few distinct brown (10YR 4/3) clay flows in root channels; few distinct dark yellowish brown (10YR 4/6) clay films on faces of peds; common fine black manganese concretions and nodules; moderately acid; gradual wavy boundary.

2Bt3—24 to 34 inches; yellowish brown (10YR 5/6) silty clay; common medium distinct brownish yellow (10YR 6/8) and yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm, moderately sticky, moderately plastic; many fine and very fine roots; many fine pores; many prominent dark yellowish brown (10YR 4/6) clay films on faces of peds; common fine black manganese concretions and nodules; moderately acid; gradual wavy boundary.

2Bt4—34 to 50 inches; yellowish brown (10YR 5/6) clay; common medium distinct very pale brown (10YR 7/3) and brownish yellow (10YR 6/8) mottles; moderate medium and coarse subangular blocky structure; very firm, moderately sticky, moderately plastic; few fine pores; many prominent brown (10YR 4/3) clay flows in root channels; common prominent dark yellowish brown (10YR 4/6) clay films on faces of peds; common fine black concretions and nodules; moderately acid; gradual wavy boundary.

2Bt5—50 to 80 inches; yellowish brown (10YR 5/8) clay; common medium prominent very pale brown (10YR 7/3) and common medium distinct brownish yellow (10YR 6/6) mottles; weak coarse and very coarse subangular blocky structure; very firm, very sticky, very plastic; many distinct dark yellowish brown (10YR 4/6) clay films on faces of peds; many medium black concretions and nodules; approximately 10 percent fragments of chert and rounded pebbles; moderately acid.

The depth to bedrock is more than 60 inches. Reaction ranges from strongly acid to slightly acid, except where lime has been added. The content of coarse fragments ranges from 0 to about 15 percent in each horizon.

The A or Ap horizon has hue of 10YR and value and chroma of 3 or 4. If value and chroma are 3, the surface horizon is less than 7 inches thick. Texture is silt loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. Texture is silty clay loam or silt loam.

The 2Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8. The number of mottles in shades of brown, yellow, and red ranges from few to many. Texture is silty clay or clay.

Formation of the Soils

This section relates the five factors of soil formation to the soils in the two physiographic regions of Jackson County.

Soils differ from one another because of variations in the material in which they formed and in the environment affecting the parent material. By studying the characteristics of an existing soil, one can build a model that shows the stages and many of the interrelated processes of soil formation. The soil characteristics provide a basis for classifying the soil in the taxonomic system.

Soils form as a result of the interaction of parent material, climate, living organisms, topography, and time. All of these factors influence the formation of every soil, but the extent to which each factor affects soil formation varies from place to place. The effect of any one factor is modified to some extent by the effects of the other four.

Parent Material

Parent material is the unconsolidated mass in which a soil forms. It determines the limits of the mineralogical and chemical characteristics of the soil.

Some of the soils in the Highland Rim region are those in the Bewleyville, Mountview, and Dickson series. These soils formed in a silty mantle underlain by limestone residuum or older alluvium. The drainage class of these soils ranges from well drained, as in the Bewleyville soils, to moderately well drained, as in the Dickson soils. Dickson soils also have a fragipan in the subsoil.

Some of the soils in the outer Central Basin region are those in the Dellrose, Armour, Arrington, and Mimosa series. Dellrose soils formed in gravelly colluvium collected at the base of limestone hillsides and, generally, the underlying clayey residuum derived from phosphatic limestone. Armour soils formed in older alluvium and residuum derived from phosphatic limestone. Arrington soils formed in recent alluvium deposited by flowing water and side slope runoff. Mimosa soils formed in clayey residuum derived from phosphatic limestone.

Climate

Climate directly affects the accumulation of parent material and the development of soil horizons. It regulates the rate of physical and chemical weathering in the parent material, including the processes of leaching, eluviation, and illuviation. Climate also influences the plant and animal life in a given locality.

The warm and humid, temperate climate in Jackson County favors the rapid physical and chemical decomposition of soil particles, minerals, and organic matter. Leaching, eluviation, illuviation, and oxidation are intensive. The resulting soils generally have a low content of organic matter and a medium or low supply of bases.

The local differences in climate caused by variations in slope, drainage, and kind of landform affect soil formation. The steeper slopes are more rapidly eroded and have higher rates of runoff than the more gentle slopes. Areas that are nearly level or concave accumulate water from the surrounding areas and may have several times as much water available for infiltration, percolation, and leaching. North- and east-facing slopes are generally cooler and stay moist longer than equivalent south- and west-facing slopes.

Living Organisms

Many of the processes through which parent material is transformed into soil are strongly influenced by living organisms and their remains and by-products. Plant remains make up most of the organic matter that is incorporated into a soil. Other living organisms, including earthworms, fungi, bacteria, insects, and various micro-organisms, also contribute organic matter to the soil.

Living organisms bring about both physical and chemical changes in soils. Mechanical mixing results from the construction of tunnels and burrows by animals, the prying and penetrating action of roots, and the upheaval of trees by wind and ice action. These changes in the soil result in deeper penetration of water and air. As a result, the depth at which soil and rock material can be weathered is increased,

allowing chemical and physical decomposition. Nutrients are continuously being recycled, both naturally and mechanically when they are applied to the surface. Plant roots absorb the nutrients from the soil and transport them into leaf, twig, and stem tissues, which are shed and fall to the surface and eventually are reincorporated into the soil.

The soils in Jackson County formed almost entirely under hardwood forest. There were differences in the density of the stands, in the relative proportions of species, and in the kinds of associated ground cover. These differences alone, however, were not sufficient to account for the marked differences in properties among the more strongly developed soils in the county.

Topography

Topography, including relief, slope, kind of landform, and aspect, influences or modifies the effects of the other soil-forming factors. The steepness, shape, and length of slope directly influence the rate of water infiltration and the runoff rate. If other factors are equal, areas where runoff is more rapid are more eroded than other areas.

Water tends to concentrate in concave areas. The amount of water that penetrates the surface is greater on the gentler slopes than on the steeper slopes. Free water moving downward through many of the soils in the county is trapped or perched above a relatively impermeable fragipan, where it stands for days or weeks or moves away laterally.

The soils on the flood plains in the county are periodically covered with fresh sediment washed from the uplands. This repeated deposition results in stratified soils that are characterized by minimal profile development.

Time

The time required for a soil to form depends on the combined influences of the other factors of soil formation. The accumulation of parent material generally requires much more time than the development of soil horizons. Less time is generally required for a soil to form in a warm, humid region that has luxuriant vegetation than in a dry, cold region that has sparse vegetation. Much less time is required if the parent material is permeable, is on gentle slopes, and is highly weatherable.

The soils in Jackson County range in age from young to very old. Most of the soils on flood plains are considered the youngest. Examples are Staser, Arrington, and Lindside soils. Soils on the stream terraces along the Cumberland and Roaring Rivers and gravelly soils on footslopes are of intermediate age. Examples are Humphreys, Holston, and Armour soils.

The oldest soils in the county are those that formed during the Ordovician Period in the Central Basin area of the county. Examples are Barfield, Gladdice, and Mimosa soils. Other mature soils of the Highland Rim physiographic region are Dickson, Mountview, Sengtown, and Christian soils.

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Glossary

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.

Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

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.

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.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

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 40-inch profile or to a limiting layer is expressed as:

Very low	0 to 2
Low	2 to 4
Moderate	4 to 6
High	more than 6

Backslope. The geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Backslopes in profile are commonly steep, are linear, and may or may not include cliff segments.

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.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Cable yarding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

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.

Channery soil material. Soil material that is, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

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.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that is 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

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 or miscellaneous areas 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 or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take 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. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

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, organic matter content, and fertility and helps to control erosion.

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

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.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

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.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 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, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

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.

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.

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 pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

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.

Fan terrace. A relict alluvial fan, no longer a site of active deposition, incised by younger and lower alluvial surfaces.

Fast intake (in tables). The rapid movement of water into the soil.

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.

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 textured soil. Sandy clay, silty clay, or clay.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

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.

Footslope. 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.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

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.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

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 A horizon. The B horizon is in part a layer of transition from the overlying A 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 overlying soil material. 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 horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the 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 seasonal 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.

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.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

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.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

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.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

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.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

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).

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

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.

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

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water 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, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

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.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

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 reproduction 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 concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

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.

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.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

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.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Saprolite. Unconsolidated residual material underlying the soil and grading to hard 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.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. 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.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell (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.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

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.

Sinkhole. A depression in the landscape where limestone has been dissolved.

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.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

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, classes for complex slopes are as follows:

Level	0 to 2 percent
Nearly level	0 to 3 percent
Undulating	2 to 5 percent
Rolling	5 to 12 percent
Hilly	12 to 20 percent
Steep	20 to 80 percent
Very steep	40 percent and higher

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

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 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

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.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies

material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion 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).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

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."

Talus. Fragments of rock and other soil material accumulated by gravity at the foot of cliffs or steep slopes.

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.

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."

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.

Toeslope. The outermost inclined surface at the base of a hill; part of a footslope.

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.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded 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.

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.

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.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1961-90 at Cookeville, Tennessee.)

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average daily	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January-----	44.3	23.8	34.0	70	-8	15	4.74	2.63	6.60	8	3.5
February----	48.5	26.4	37.4	74	1	24	4.49	2.76	6.04	8	2.9
March-------	58.8	35.6	47.2	80	14	96	5.81	3.34	8.01	9	0.9
April-------	68.7	44.4	56.6	87	24	241	4.66	2.98	6.19	8	0.1
May---------	76.6	52.6	64.6	89	34	450	5.42	3.29	7.33	8	0.0
June--------	84.0	60.9	72.5	94	44	673	4.14	1.76	6.16	6	0.0
July--------	87.1	64.7	75.9	97	52	802	5.37	3.46	7.10	8	0.0
August------	86.7	63.5	75.1	97	50	771	4.23	2.45	5.82	7	0.0
September---	81.1	56.9	69.0	94	38	567	4.22	2.37	5.86	6	0.0
October-----	70.9	44.3	57.6	86	26	261	3.36	1.80	4.95	5	0.0
November----	59.5	36.5	48.0	80	14	97	4.77	3.05	6.33	7	0.9
December----	48.8	28.4	38.6	72	2	30	5.39	3.02	7.49	8	1.2
Yearly:											
Average---	67.9	44.8	56.4	---	---	---	---	---	---	---	---
Extreme---	---	---	---	98	-10	---	---	---	---	---	---
Total-----	---	---	---	---	---	4,026	56.59	48.82	64.09	88	9.5

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the period 1961-90 at Cookeville, Tennessee.)

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. 9	Apr. 16	May 2
2 years in 10 later than--	Apr. 3	Apr. 11	Apr. 26
5 years in 10 later than--	Mar. 22	Apr. 2	Apr. 15
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 31	Oct. 18	Oct. 5
2 years in 10 earlier than--	Nov. 5	Oct. 23	Oct. 10
5 years in 10 earlier than--	Nov. 15	Nov. 1	Oct. 20

Table 3.--Growing Season

(Recorded in the period 1961-90 at Cookeville, Tennessee.)

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	216	194	167
8 years in 10	223	200	174
5 years in 10	237	212	187
2 years in 10	250	224	200
1 year in 10	257	230	207

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
AmB	Armour silt loam, 2 to 5 percent slopes	1,241	0.6
AmC2	Armour silt loam, 5 to 12 percent slopes, eroded	623	0.3
AmD2	Armour silt loam, 12 to 20 percent slopes, eroded	127	*
Ar	Arrington silt loam, occasionally flooded	3,033	1.5
BaF	Barfield-Gladdice-Rock outcrop complex, 20 to 70 percent slopes	47,062	22.9
BcD	Barfield-Rock outcrop complex, 5 to 20 percent slopes	1,950	1.0
BeB2	Bewleyville silt loam, 2 to 5 percent slopes, eroded	289	0.1
BeC2	Bewleyville silt loam, 5 to 12 percent slopes, eroded	542	0.3
CrB2	Christian silt loam, 2 to 5 percent slopes, eroded	23	*
CrC2	Christian silt loam, 5 to 12 percent slopes, eroded	10,837	5.3
CrD2	Christian silt loam, 12 to 20 percent slopes, eroded	3,545	1.7
DaF	Dellrose and Mimosa soils, 20 to 60 percent slopes	16,304	7.9
DeC	Dellrose gravelly silt loam, 5 to 12 percent slopes	432	0.2
DeD2	Dellrose gravelly silt loam, 12 to 20 percent slopes, eroded	324	0.2
DeE	Dellrose gravelly silt loam, 20 to 45 percent slopes	876	0.4
DkB2	Dickson silt loam, 2 to 5 percent slopes, eroded	1,002	0.5
DkC2	Dickson silt loam, 5 to 8 percent slopes, eroded	9	*
HaD	Hawthorne gravelly silt loam, 5 to 20 percent slopes	10,951	5.3
HaF	Hawthorne gravelly silt loam, 20 to 70 percent slopes	69,470	33.7
HdF	Hawthorne-Rock outcrop complex, 40 to 80 percent slopes	105	*
HoB	Holston loam, 2 to 5 percent slopes	936	0.5
HoC2	Holston loam, 5 to 12 percent slopes, eroded	2,038	1.0
HoD2	Holston loam, 12 to 20 percent slopes, eroded	599	0.3
HoD3	Holston loam, 12 to 20 percent slopes, severely eroded	433	0.2
HuB	Humphreys gravelly silt loam, 2 to 5 percent slopes	550	0.3
HuC	Humphreys gravelly silt loam, 5 to 12 percent slopes	770	0.4
Ld	Lindside silt loam, occasionally flooded	1,149	0.6
MmB2	Mimosa silty clay loam, 2 to 5 percent slopes, eroded	112	*
MmC2	Mimosa silty clay loam, 5 to 12 percent slopes, eroded	1,956	1.0
MmD2	Mimosa silty clay loam, 12 to 20 percent slopes, eroded	1,950	1.0
Mn	Minter silt loam, occasionally flooded	285	0.1
MtB2	Mountview silt loam, 2 to 5 percent slopes, eroded	6,155	3.0
MtC2	Mountview silt loam, 5 to 12 percent slopes, eroded	1,653	0.8
Oc	Ocana gravelly silt loam, occasionally flooded	3,777	1.8
Sk	Skidmore gravelly loam, occasionally flooded	1,356	0.7
St	Staser loam, occasionally flooded	1,379	0.7
SuC2	Sugargrove gravelly silt loam, 5 to 12 percent slopes, eroded	2,795	1.4
SuD2	Sugargrove gravelly silt loam, 12 to 20 percent slopes, eroded	833	0.4
SwB	Swafford loam, 2 to 5 percent slopes	688	0.3
SwC	Swafford loam, 5 to 12 percent slopes	113	*
SyB2	Sykes silt loam, 2 to 5 percent slopes, eroded	278	0.1
SyC2	Sykes silt loam, 5 to 12 percent slopes, eroded	677	0.3
Ud	Udarents, clayey	87	*
W	Water	6,686	3.2
	Total	206,000	100.0

* Less than 0.1 percent.

Table 5.--Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland.)

Map symbol	Soil name
AmB	Armour silt loam, 2 to 5 percent slopes
Ar	Arrington silt loam, occasionally flooded
BeB2	Bewleyville silt loam, 2 to 5 percent slopes, eroded
CrB2	Christian silt loam, 2 to 5 percent slopes, eroded
DkB2	Dickson silt loam, 2 to 5 percent slopes, eroded
HoB	Holston loam, 2 to 5 percent slopes
HuB	Humphreys gravelly silt loam, 2 to 5 percent slopes
Ld	Lindside silt loam, occasionally flooded
MtB2	Mountview silt loam, 2 to 5 percent slopes, eroded
Oc	Ocana gravelly silt loam, occasionally flooded
St	Staser loam, occasionally flooded
SwB	Swafford loam, 2 to 5 percent slopes
SyB2	Sykes silt loam, 2 to 5 percent slopes, eroded

Table 6.--Land Capability and Yields per Acre of Crops

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil.)

Map symbol and soil name	Land capability	Corn	Soybeans	Tobacco	Wheat
		Bu	Bu	Lbs	Bu
AmB---------- Armour	2e	120	43	2,900	55
AmC2---------- Armour	3e	100	38	2,550	50
AmD2---------- Armour	4e	85	30	2,100	45
Ar---------- Arrington	2w	125	45	2,800	---
BaF----------	7s				
Barfield----------		---	---	---	---
Gladdice----------		---	---	---	---
Rock outcrop.					
BcD----------	6s				
Barfield----------		---	---	---	---
Rock outcrop.					
BeB2---------- Bewleyville	2e	110	40	2,700	53
BeC2---------- Bewleyville	3e	95	38	2,550	50
CrB2---------- Christian	2e	85	35	2,500	40
CrC2---------- Christian	3e	80	30	2,300	35
CrD2---------- Christian	6e	---	---	---	---
DaF----------	7e				
Dellrose----------		---	---	---	---
Mimosa----------		---	---	---	---
DeC---------- Dellrose	3e	85	32	2,200	45
DeD2---------- Dellrose	4e	70	25	1,900	30
DeE---------- Dellrose	6e	---	---	---	---
DkB2---------- Dickson	2e	80	35	2,200	50
DkC2---------- Dickson	3e	80	30	1,900	45

Table 6.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Tobacco	Wheat
		Bu	Bu	Lbs	Bu
HaD---------- Hawthorne	4s	---	---	---	---
HaF---------- Hawthorne	7s	---	---	---	---
HdF---------- Hawthorne---------- Rock outcrop.	7s	---	---	---	---
HoB---------- Holston	2e	100	38	2,600	45
HoC2---------- Holston	3e	90	30	2,400	40
HoD2---------- Holston	4e	80	25	2,100	35
HoD3---------- Holston	6e	---	---	---	---
HuB---------- Humphreys	2e	90	35	2,300	50
HuC---------- Humphreys	3e	85	32	2,200	45
Ld---------- Lindside	2w	125	45	2,600	---
MmB2---------- Mimosa	3e	45	25	1,400	45
MmC2---------- Mimosa	4e	40	22	1,250	40
MmD2---------- Mimosa	6e	---	---	---	---
Mn---------- Minter	4w	---	---	---	---
MtB2---------- Mountview	2e	95	38	2,650	52
MtC2---------- Mountview	3e	85	35	2,550	50
Oc---------- Ocana	2w	85	30	2,200	---
Sk---------- Skidmore	3s	50	20	---	---
St---------- Staser	2w	110	40	2,500	---
SuC2---------- Sugargrove	3e	75	22	2,000	35

Table 6.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability	Corn	Soybeans	Tobacco	Wheat
		Bu	Bu	Lbs	Bu
SuD2---------- Sugargrove	4e	65	20	---	28
SwB---------- Swafford	2e	95	38	2,300	50
SwC---------- Swafford	3e	90	35	2,000	45
SyB2---------- Sykes	2e	110	40	2,700	50
SyC2---------- Sykes	3e	95	35	2,500	45
Ud: Udarents.					

Table 7.--Land Capability and Yields per Acre of Pasture and Hay

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil.)

Map symbol and soil name	Land capability	Alfalfa hay	Tall fescue-ladino
		Tons	AUM
AmB Armour	2e	4.00	8.00
AmC2 Armour	3e	3.50	7.50
AmD2 Armour	4e	3.00	6.50
Ar Arrington	2w	---	8.00
BaF	7s		
Barfield		---	---
Gladdice		---	---
Rock outcrop.			
BcD	6s		
Barfield		---	3.50
Rock outcrop.			
BeB2 Bewleyville	2e	4.00	8.00
BeC2 Bewleyville	3e	3.50	7.50
CrB2 Christian	2e	3.00	7.80
CrC2 Christian	3e	2.80	7.00
CrD2 Christian	6e	2.00	5.50
DaF	7e		
Dellrose		---	---
Mimosa		---	---
DeC Dellrose	3e	3.00	6.00
DeD2 Dellrose	4e	2.20	5.50
DeE Dellrose	6e	---	---
DkB2 Dickson	2e	---	7.00
DkC2 Dickson	3e	---	6.00

Table 7.--Land Capability and Yields per Acre of Pasture and Hay--Continued

Map symbol and soil name	Land capability	Alfalfa hay	Tall fescue-ladino
		Tons	AUM
HaD---------- Hawthorne	4s	---	4.00
HaF---------- Hawthorne	7s	---	---
HdF---------- Hawthorne---------- Rock outcrop.	7s	---	---
HoB---------- Holston	2e	3.80	7.50
HoC2---------- Holston	3e	3.20	6.50
HoD2---------- Holston	4e	2.80	6.00
HoD3---------- Holston	6e	2.00	5.80
HuB---------- Humphreys	2e	3.20	6.50
HuC---------- Humphreys	3e	3.00	6.00
Ld---------- Lindside	2w	---	8.00
MmB2---------- Mimosa	3e	---	4.50
MmC2---------- Mimosa	4e	---	4.00
MmD2---------- Mimosa	6e	---	3.00
Mn---------- Minter	4w	---	5.00
MtB2---------- Mountview	2e	4.00	8.00
MtC2---------- Mountview	3e	3.50	7.50
Oc---------- Ocana	2w	---	7.00
Sk---------- Skidmore	3s	---	5.00
St---------- Staser	2w	---	8.00
SuC2---------- Sugargrove	3e	---	5.50

Table 7.--Land Capability and Yields per Acre of Pasture and Hay--Continued

Map symbol and soil name	Land capability	Alfalfa hay	Tall fescue-ladino
		Tons	AUM
SuD2---------- Sugargrove	4e	---	5.00
SwB---------- Swafford	2e	---	7.00
SwC---------- Swafford	3e	---	6.00
SyB2---------- Sykes	2e	3.50	7.50
SyC2---------- Sykes	3e	3.00	6.50
Ud: Udarents.			

Table 8a.--Forestland Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AmB:							
Armour	100	Moderate: strength	0.50	Moderately suited: strength	0.50	Severe: strength	1.00
AmC2:							
Armour	100	Moderate: strength	0.50	Moderately suited: strength slope	0.50 0.50	Severe: strength	1.00
AmD2:							
Armour	100	Moderate: slope strength	0.50 0.50	Poorly suited: slope strength	1.00 0.50	Severe: strength	1.00
Ar:							
Arrington	100	Moderate: flooding strength	0.50 0.50	Moderately suited: flooding strength	0.50 0.50	Severe: strength	1.00
BaF:							
Barfield	30	Severe: slope strength landslides	1.00 0.50 0.10	Poorly suited: slope strength landslides	1.00 0.50 0.10	Severe: strength	1.00
Gladdice	25	Severe: slope strength landslides	1.00 0.50 0.10	Poorly suited: slope strength landslides	1.00 0.50 0.10	Severe: strength	1.00
Rock outcrop	20	Not rated		Not rated		Not rated	
BcD:							
Barfield	45	Severe: restrictive layer strength landslides	1.00 0.50 0.10	Poorly suited: slope strength landslides	1.00 0.50 0.10	Severe: strength	1.00
Rock outcrop	40	Not rated		Not rated		Not rated	
BeB2:							
Bewleyville	100	Moderate: strength	0.50	Moderately suited: strength	0.50	Severe: strength	1.00
BeC2:							
Bewleyville	100	Moderate: strength	0.50	Moderately suited: strength slope	0.50 0.50	Severe: strength	1.00
CrB2:							
Christian	100	Moderate: strength	0.50	Moderately suited: strength	0.50	Severe: strength	1.00

Table 8a.--Forestland Management--Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CrC2:							
Christian	100	Moderate:		Moderately suited:		Severe:	
		strength	0.50	strength	0.50	strength	1.00
				slope	0.50		
CrD2:							
Christian	100	Moderate:		Poorly suited:		Severe:	
		slope	0.50	slope	1.00	strength	1.00
		stickiness/slope	0.50	strength	0.50		
		strength	0.50				
DaF:							
Dellrose	55	Severe:		Poorly suited:		Severe:	
		landslides	1.00	slope	1.00	strength	1.00
		slope	1.00	landslides	1.00		
		strength	0.50	strength	0.50		
Mimosa	35	Severe:		Poorly suited:		Severe:	
		slope	1.00	slope	1.00	strength	1.00
		strength	0.50	strength	0.50		
DeC:							
Dellrose	100	Moderate:		Moderately suited:		Severe:	
		strength	0.50	strength	0.50	strength	1.00
		landslides	0.10	slope	0.50		
				landslides	0.10		
DeD2:							
Dellrose	100	Moderate:		Poorly suited:		Severe:	
		landslides	0.50	slope	1.00	strength	1.00
		slope	0.50	strength	0.50		
		strength	0.50	landslides	0.50		
DeE:							
Dellrose	100	Severe:		Poorly suited:		Severe:	
		landslides	1.00	slope	1.00	strength	1.00
		slope	1.00	landslides	1.00		
		strength	0.50	strength	0.50		
DkB2:							
Dickson	100	Moderate:		Moderately suited:		Severe:	
		strength	0.50	strength	0.50	strength	1.00
				wetness	0.50		
DkC2:							
Dickson	100	Moderate:		Moderately suited:		Severe:	
		strength	0.50	strength	0.50	strength	1.00
				wetness	0.50		
				slope	0.50		
HaD:							
Hawthorne	100	Moderate:		Poorly suited:		Severe:	
		landslides	0.50	slope	1.00	strength	1.00
		strength	0.50	strength	0.50		
				landslides	0.50		

Table 8a.--Forestland Management--Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HaF:							
Hawthorne	100	Severe:		Poorly suited:		Severe:	
		landslides	1.00	slope	1.00	strength	1.00
		slope	1.00	landslides	1.00		
		strength	0.50	strength	0.50		
HdF:							
Hawthorne	48	Severe:		Poorly suited:		Severe:	
		slope	1.00	slope	1.00	strength	1.00
		landslides	1.00	landslides	1.00		
		strength	0.50	strength	0.50		
Rock outcrop	47	Not rated		Not rated		Not rated	
HoB:							
Holston	100	Moderate:		Moderately suited:		Severe:	
		strength	0.50	strength	0.50	strength	1.00
HoC2:							
Holston	100	Moderate:		Moderately suited:		Severe:	
		strength	0.50	strength	0.50	strength	1.00
				slope	0.50		
HoD2:							
Holston	100	Moderate:		Poorly suited:		Severe:	
		slope	0.50	slope	1.00	strength	1.00
		strength	0.50	strength	0.50		
HoD3:							
Holston	100	Moderate:		Poorly suited:		Severe:	
		slope	0.50	slope	1.00	strength	1.00
		strength	0.50	strength	0.50		
HuB:							
Humphreys	100	Moderate:		Moderately suited:		Severe:	
		strength	0.50	strength	0.50	strength	1.00
HuC:							
Humphreys	100	Moderate:		Moderately suited:		Severe:	
		strength	0.50	strength	0.50	strength	1.00
				slope	0.50		
Ld:							
Lindside	100	Moderate:		Moderately suited:		Severe:	
		flooding	0.50	flooding	0.50	strength	1.00
		strength	0.50	strength	0.50		
				wetness	0.50		
MmB2:							
Mimosa	100	Slight		Moderately suited:		Severe:	
				strength	0.50	strength	1.00
MmC2:							
Mimosa	100	Slight		Moderately suited:		Severe:	
				strength	0.50	strength	1.00
				slope	0.50		

Table 8a.--Forestland Management--Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MmD2:							
Mimosa	100	Moderate:		Poorly suited:		Severe:	
		slope	0.50	slope	1.00	strength	1.00
		stickiness/slope	0.50	strength	0.50		
		restrictive layer	0.50				
		strength	0.50				
Mn:							
Minter	100	Moderate:		Poorly suited:		Severe:	
		flooding	0.50	wetness	1.00	strength	1.00
		strength	0.50	flooding	0.50		
				strength	0.50		
MtB2:							
Mountview	100	Moderate:		Moderately suited:		Severe:	
		strength	0.50	strength	0.50	strength	1.00
				wetness	0.50		
MtC2:							
Mountview	100	Moderate:		Moderately suited:		Severe:	
		strength	0.50	strength	0.50	strength	1.00
				slope	0.50		
				wetness	0.50		
Oc:							
Ocana	100	Moderate:		Moderately suited:		Severe:	
		flooding	0.50	flooding	0.50	strength	1.00
		strength	0.50	strength	0.50		
Sk:							
Skidmore	100	Severe:		Poorly suited:		Slight	
		flooding	1.00	flooding	1.00	strength	0.10
St:							
Staser	100	Moderate:		Moderately suited:		Severe:	
		flooding	0.50	flooding	0.50	strength	1.00
		strength	0.50	strength	0.50		
SuC2:							
Sugargrove	100	Moderate:		Moderately suited:		Severe:	
		strength	0.50	strength	0.50	strength	1.00
				slope	0.50		
SuD2:							
Sugargrove	100	Moderate:		Poorly suited:		Severe:	
		landslides	0.50	slope	1.00	strength	1.00
		slope	0.50	strength	0.50		
		strength	0.50	landslides	0.50		
SwB:							
Swafford	100	Moderate:		Moderately suited:		Severe:	
		strength	0.50	strength	0.50	strength	1.00
SwC:							
Swafford	100	Moderate:		Moderately suited:		Severe:	
		strength	0.50	strength	0.50	strength	1.00
				slope	0.50		

Table 8a.--Forestland Management--Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SyB2:							
Sykes	100	Moderate: strength	0.50	Moderately suited: strength	0.50	Severe: strength	1.00
SyC2:							
Sykes	100	Moderate: strength landslides	0.50 0.10	Moderately suited: strength slope landslides	0.50 0.50 0.10	Severe: strength	1.00
Ud:							
Udarents	100	Not rated		Not rated		Not rated	

Table 8b.--Forestland Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AmB:							
Armour	100	Slight		Moderate: slope/erodibility	0.50	Moderately suited: strength	0.50
AmC2:							
Armour	100	Slight		Severe: slope/erodibility	0.95	Moderately suited: strength	0.50
						slope	0.50
AmD2:							
Armour	100	Moderate: slope/erodibility	0.50	Severe: slope/erodibility	0.95	Poorly suited: slope	1.00
						strength	0.50
Ar:							
Arrington	100	Slight		Slight		Moderately suited: flooding	0.50
						strength	0.50
BaF:							
Barfield	30	Severe: slope/erodibility	0.75	Severe: slope/erodibility	0.95	Poorly suited: slope	1.00
						strength	0.50
						landslides	0.10
Gladdice	25	Severe: slope/erodibility	0.75	Severe: slope/erodibility	0.95	Poorly suited: slope	1.00
						strength	0.50
						landslides	0.10
Rock outcrop	20	Not rated		Not rated		Not rated	
BcD:							
Barfield	45	Slight		Severe: slope/erodibility	0.95	Poorly suited: slope	1.00
						strength	0.50
						landslides	0.10
Rock outcrop	40	Not rated		Not rated		Not rated	
BeB2:							
Bewleyville	100	Slight		Moderate: slope/erodibility	0.50	Moderately suited: strength	0.50
BeC2:							
Bewleyville	100	Slight		Severe: slope/erodibility	0.95	Moderately suited: strength	0.50
						slope	0.50
CrB2:							
Christian	100	Slight		Moderate: slope/erodibility	0.50	Moderately suited: strength	0.50

Table 8b.--Forestland Management--Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CrC2:							
Christian	100	Slight		Severe: slope/erodibility	0.95	Moderately suited: strength	0.50
						slope	0.50
CrD2:							
Christian	100	Moderate: slope/erodibility	0.50	Severe: slope/erodibility	0.95	Poorly suited: slope	1.00
						strength	0.50
DaF:							
Dellrose	55	Severe: slope/erodibility	0.75	Severe: slope/erodibility	0.95	Poorly suited: slope	1.00
						landslides	1.00
						strength	0.50
Mimosa	35	Severe: slope/erodibility	0.75	Severe: slope/erodibility	0.95	Poorly suited: slope	1.00
						strength	0.50
						landslides	0.10
DeC:							
Dellrose	100	Slight		Severe: slope/erodibility	0.95	Moderately suited: strength	0.50
						slope	0.50
						landslides	0.10
DeD2:							
Dellrose	100	Moderate: slope/erodibility	0.50	Severe: slope/erodibility	0.95	Poorly suited: slope	1.00
						strength	0.50
						landslides	0.50
DeE:							
Dellrose	100	Moderate: slope/erodibility	0.50	Severe: slope/erodibility	0.95	Poorly suited: slope	1.00
						landslides	1.00
						strength	0.50
DkB2:							
Dickson	100	Slight		Moderate: slope/erodibility	0.50	Moderately suited: strength	0.50
						wetness	0.50
DkC2:							
Dickson	100	Slight		Moderate: slope/erodibility	0.50	Moderately suited: strength	0.50
						wetness	0.50
						slope	0.50
HaD:							
Hawthorne	100	Slight		Moderate: slope/erodibility	0.50	Poorly suited: slope	1.00
						strength	0.50
						landslides	0.50

Table 8b.--Forestland Management--Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HaF:							
Hawthorne	100	Severe: slope/erodibility	0.75	Severe: slope/erodibility	0.95	Poorly suited: slope	1.00
						landslides	1.00
						strength	0.50
HdF:							
Hawthorne	48	Very severe: slope/erodibility	0.95	Severe: slope/erodibility	0.95	Poorly suited: slope	1.00
						landslides	1.00
						strength	0.50
Rock outcrop	47	Not rated		Not rated		Not rated	
HoB:							
Holston	100	Slight		Moderate: slope/erodibility	0.50	Moderately suited: strength	0.50
HoC2:							
Holston	100	Slight		Severe: slope/erodibility	0.95	Moderately suited: strength	0.50
						slope	0.50
HoD2:							
Holston	100	Moderate: slope/erodibility	0.50	Severe: slope/erodibility	0.95	Poorly suited: slope	1.00
						strength	0.50
HoD3:							
Holston	100	Moderate: slope/erodibility	0.50	Severe: slope/erodibility	0.95	Poorly suited: slope	1.00
						strength	0.50
HuB:							
Humphreys	100	Slight		Moderate: slope/erodibility	0.50	Moderately suited: strength	0.50
HuC:							
Humphreys	100	Slight		Severe: slope/erodibility	0.95	Moderately suited: strength	0.50
						slope	0.50
Ld:							
Lindside	100	Slight		Slight		Moderately suited: flooding	0.50
						strength	0.50
						wetness	0.50
MmB2:							
Mimosa	100	Slight		Moderate: slope/erodibility	0.50	Moderately suited: strength	0.50
MmC2:							
Mimosa	100	Slight		Severe: slope/erodibility	0.95	Moderately suited: strength	0.50
						slope	0.50

Table 8b.--Forestland Management--Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MmD2:							
Mimosa	100	Moderate: slope/erodibility	0.50	Severe: slope/erodibility	0.95	Poorly suited: slope	1.00
						strength	0.50
Mn:							
Minter	100	Slight		Slight		Poorly suited: wetness	1.00
						flooding	0.50
						strength	0.50
MtB2:							
Mountview	100	Slight		Moderate: slope/erodibility	0.50	Moderately suited: strength	0.50
						wetness	0.50
MtC2:							
Mountview	100	Slight		Severe: slope/erodibility	0.95	Moderately suited: strength	0.50
						slope	0.50
						wetness	0.50
Oc:							
Ocana	100	Slight		Slight		Moderately suited: flooding	0.50
						strength	0.50
Sk:							
Skidmore	100	Slight		Slight		Poorly suited: flooding	1.00
St:							
Staser	100	Slight		Slight		Moderately suited: flooding	0.50
						strength	0.50
SuC2:							
Sugargrove	100	Slight		Severe: slope/erodibility	0.95	Moderately suited: strength	0.50
						slope	0.50
SuD2:							
Sugargrove	100	Moderate: slope/erodibility	0.50	Severe: slope/erodibility	0.95	Poorly suited: slope	1.00
						strength	0.50
						landslides	0.50
SwB:							
Swafford	100	Slight		Moderate: slope/erodibility	0.50	Moderately suited: strength	0.50
SwC:							
Swafford	100	Slight		Severe: slope/erodibility	0.95	Moderately suited: strength	0.50
						slope	0.50
SyB2:							
Sykes	100	Slight		Moderate: slope/erodibility	0.50	Moderately suited: strength	0.50

Table 8b.--Forestland Management--Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SyC2:							
Sykes	100	Slight		Severe: slope/erodibility	0.95	Moderately suited: strength	0.50
						slope	0.50
						landslides	0.10
Ud:							
Udarents	100	Not rated		Not rated		Not rated	

Table 8c.--Forestland Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Suitability for use of harvesting equipment	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AmB:							
Armour	100	Well suited		Well suited		Moderately suited: strength	0.50
AmC2:							
Armour	100	Well suited		Moderately suited: slope	0.50	Moderately suited: strength	0.50
AmD2:							
Armour	100	Well suited		Poorly suited: slope	0.75	Moderately suited: strength	0.50
Ar:							
Arrington	100	Well suited		Well suited		Moderately suited: strength	0.50
BaF:							
Barfield	30	Moderately suited: stickiness	0.50	Unsuited: slope	1.00	Poorly suited: slope	1.00
		slope	0.50	stickiness	0.50	strength	0.50
Gladdice	25	Moderately suited: stickiness	0.50	Unsuited: slope	1.00	Poorly suited: slope	1.00
		slope	0.50	stickiness	0.50	strength	0.50
				rock fragments	0.50		
Rock outcrop	20	Not rated		Not rated		Not rated	
BcD:							
Barfield	45	Moderately suited: stickiness	0.50	Moderately suited: slope	0.50	Moderately suited: strength	0.50
				stickiness	0.50		
Rock outcrop	40	Not rated		Not rated		Not rated	
BeB2:							
Bewleyville	100	Well suited		Well suited		Moderately suited: strength	0.50
BeC2:							
Bewleyville	100	Well suited		Moderately suited: slope	0.50	Moderately suited: strength	0.50
CrB2:							
Christian	100	Well suited		Well suited		Moderately suited: strength	0.50
CrC2:							
Christian	100	Well suited		Moderately suited: slope	0.50	Moderately suited: strength	0.50
CrD2:							
Christian	100	Well suited		Poorly suited: slope	0.75	Moderately suited: strength	0.50

Table 8c.--Forestland Management--Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Suitability for use of harvesting equipment	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
DaF:							
Dellrose	55	Moderately suited:		Unsuited:		Poorly suited:	
		slope	0.50	slope	1.00	slope	1.00
				rock fragments	0.50	strength	0.50
Mimosa	35	Moderately suited:		Unsuited:		Poorly suited:	
		stickiness	0.50	slope	1.00	slope	1.00
		slope	0.50	stickiness	0.50	strength	0.50
DeC:							
Dellrose	100	Well suited		Moderately suited:		Moderately suited:	
				slope	0.50	strength	0.50
				rock fragments	0.50		
DeD2:							
Dellrose	100	Well suited		Poorly suited:		Moderately suited:	
				slope	0.75	strength	0.50
				rock fragments	0.50		
DeE:							
Dellrose	100	Well suited		Unsuited:		Moderately suited:	
				slope	1.00	slope	0.50
				rock fragments	0.50	strength	0.50
DkB2:							
Dickson	100	Well suited		Well suited		Moderately suited:	
						strength	0.50
DkC2:							
Dickson	100	Well suited		Moderately suited:		Moderately suited:	
				slope	0.50	strength	0.50
HaD:							
Hawthorne	100	Well suited		Moderately suited:		Moderately suited:	
				slope	0.50	strength	0.50
				rock fragments	0.50		
HaF:							
Hawthorne	100	Moderately suited:		Unsuited:		Poorly suited:	
		slope	0.50	slope	1.00	slope	1.00
				rock fragments	0.50	strength	0.50
HdF:							
Hawthorne	48	Moderately suited:		Unsuited:		Poorly suited:	
		slope	0.50	slope	1.00	slope	1.00
				rock fragments	0.50	strength	0.50
Rock outcrop	47	Not rated		Not rated		Not rated	
HoB:							
Holston	100	Well suited		Well suited		Moderately suited:	
						strength	0.50
HoC2:							
Holston	100	Well suited		Moderately suited:		Moderately suited:	
				slope	0.50	strength	0.50
HoD2:							
Holston	100	Well suited		Poorly suited:		Moderately suited:	
				slope	0.75	strength	0.50

Table 8c.--Forestland Management--Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Suitability for use of harvesting equipment	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HoD3:							
Holston	100	Well suited		Poorly suited: slope	0.75	Moderately suited: strength	0.50
HuB:							
Humphreys	100	Well suited		Moderately suited: rock fragments	0.50	Moderately suited: strength	0.50
HuC:							
Humphreys	100	Well suited		Moderately suited: slope	0.50	Moderately suited: strength	0.50
				rock fragments	0.50		
Ld:							
Lindside	100	Well suited		Well suited		Moderately suited: strength	0.50
MmB2:							
Mimosa	100	Moderately suited: stickiness	0.50	Moderately suited: stickiness	0.50	Moderately suited: strength	0.50
MmC2:							
Mimosa	100	Moderately suited: stickiness	0.50	Moderately suited: stickiness	0.50	Moderately suited: strength	0.50
				slope	0.50		
MmD2:							
Mimosa	100	Moderately suited: stickiness	0.50	Poorly suited: slope	0.75	Moderately suited: strength	0.50
				stickiness	0.50		
Mn:							
Minter	100	Moderately suited: stickiness	0.50	Moderately suited: stickiness	0.50	Moderately suited: strength	0.50
MtB2:							
Mountview	100	Well suited		Well suited		Moderately suited: strength	0.50
MtC2:							
Mountview	100	Well suited		Moderately suited: slope	0.50	Moderately suited: strength	0.50
Oc:							
Ocana	100	Well suited		Moderately suited: rock fragments	0.50	Moderately suited: strength	0.50
Sk:							
Skidmore	100	Well suited		Moderately suited: rock fragments	0.50	Well suited	
St:							
Staser	100	Well suited		Well suited		Moderately suited: strength	0.50
SuC2:							
Sugargrove	100	Well suited		Moderately suited: slope	0.50	Moderately suited: strength	0.50
				rock fragments	0.50		

Table 8c.--Forestland Management--Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting		Suitability for mechanical planting		Suitability for use of harvesting equipment	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SuD2:							
Sugargrove	100	Well suited		Poorly suited:		Moderately suited:	
				slope	0.75	strength	0.50
				rock fragments	0.50		
SwB:							
Swafford	100	Well suited		Well suited		Moderately suited:	
						strength	0.50
SwC:							
Swafford	100	Well suited		Moderately suited:		Moderately suited:	
				slope	0.50	strength	0.50
SyB2:							
Sykes	100	Well suited		Well suited		Moderately suited:	
						strength	0.50
SyC2:							
Sykes	100	Well suited		Moderately suited:		Moderately suited:	
				slope	0.50	strength	0.50
Ud:							
Udarents	100	Not rated		Not rated		Not rated	

Table 8d.--Forestland Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface)		Suitability for mechanical site preparation (deep)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
AmB:					
Armour	100	Well suited		Well suited	
AmC2:					
Armour	100	Well suited		Well suited	
AmD2:					
Armour	100	Poorly suited:		Poorly suited:	
		slope	0.50	slope	0.50
Ar:					
Arrington	100	Well suited		Well suited	
BaF:					
Barfield	30	Unsuited:		Unsuited:	
		slope	1.00	slope	1.00
				restrictive layer	1.00
Gladdice	25	Unsuited:		Unsuited:	
		slope	1.00	slope	1.00
		stickiness	0.50	restrictive layer	0.50
Rock outcrop	20	Not rated		Not rated	
BcD:					
Barfield	45	Well suited		Unsuited:	
				restrictive layer	1.00
Rock outcrop	40	Not rated		Not rated	
BeB2:					
Bewleyville	100	Well suited		Well suited	
BeC2:					
Bewleyville	100	Well suited		Well suited	
CrB2:					
Christian	100	Well suited		Well suited	
CrC2:					
Christian	100	Well suited		Well suited	
CrD2:					
Christian	100	Poorly suited:		Poorly suited:	
		slope	0.50	slope	0.50
DaF:					
Dellrose	55	Unsuited:		Unsuited:	
		slope	1.00	slope	1.00
Mimosa	35	Unsuited:		Unsuited:	
		slope	1.00	slope	1.00
		stickiness	0.50		

Table 8d.--Forestland Management--Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface)		Suitability for mechanical site preparation (deep)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
DeC:					
Dellrose	100	Well suited		Well suited	
DeD2:					
Dellrose	100	Poorly suited: slope	0.50	Poorly suited: slope	0.50
DeE:					
Dellrose	100	Poorly suited: slope	0.50	Poorly suited: slope	0.50
DkB2:					
Dickson	100	Well suited		Well suited	
DkC2:					
Dickson	100	Well suited		Well suited	
HaD:					
Hawthorne	100	Well suited		Well suited	
HaF:					
Hawthorne	100	Unsuited: slope	1.00	Unsuited: slope	1.00
HdF:					
Hawthorne	48	Unsuited: slope	1.00	Unsuited: slope	1.00
Rock outcrop	47	Not rated		Not rated	
HoB:					
Holston	100	Well suited		Well suited	
HoC2:					
Holston	100	Well suited		Well suited	
HoD2:					
Holston	100	Poorly suited: slope	0.50	Poorly suited: slope	0.50
HoD3:					
Holston	100	Poorly suited: slope	0.50	Poorly suited: slope	0.50
HuB:					
Humphreys	100	Well suited		Well suited	
HuC:					
Humphreys	100	Well suited		Well suited	
Ld:					
Lindside	100	Well suited		Well suited	
MmB2:					
Mimosa	100	Poorly suited: stickiness	0.50	Well suited	

Table 8d.--Forestland Management--Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface)		Suitability for mechanical site preparation (deep)	
		Rating class and limiting features	Value	Rating class and limiting features	Value
MmC2:					
Mimosa	100	Poorly suited: stickiness	0.50	Well suited	
MmD2:					
Mimosa	100	Poorly suited: slope stickiness	0.50 0.50	Poorly suited: slope	0.50
Mn:					
Minter	100	Well suited		Well suited	
MtB2:					
Mountview	100	Well suited		Well suited	
MtC2:					
Mountview	100	Well suited		Well suited	
Oc:					
Ocana	100	Well suited		Well suited	
Sk:					
Skidmore	100	Well suited		Well suited	
St:					
Staser	100	Well suited		Well suited	
SuC2:					
Sugargrove	100	Well suited		Well suited	
SuD2:					
Sugargrove	100	Poorly suited: slope	0.50	Poorly suited: slope	0.50
SwB:					
Swafford	100	Well suited		Well suited	
SwC:					
Swafford	100	Well suited		Well suited	
SyB2:					
Sykes	100	Well suited		Well suited	
SyC2:					
Sykes	100	Well suited		Well suited	
Ud:					
Udarents	100	Not rated		Not rated	

Table 8e.--Forest Productivity

Map symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site index	Volume of wood fiber	
			cu ft/ac	
AmB:				
Armour	Yellow poplar	100	107	Yellow poplar,
	Shortleaf pine	90	144	shortleaf pine,
	Black walnut	85	75	black walnut,
	White oak	80	62	white oak,
	Southern red oak	80	62	southern red oak
AmC2:				
Armour	Yellow poplar	100	107	Yellow poplar,
	Shortleaf pine	90	144	shortleaf pine,
	Black walnut	85	75	black walnut,
	White oak	80	62	white oak,
	Southern red oak	80	62	southern red oak
AmD2:				
Armour	Yellow poplar	100	107	Yellow poplar,
	Shortleaf pine	90	144	shortleaf pine,
	Black walnut	85	75	black walnut,
	White oak	80	62	white oak,
	Southern red oak	80	62	southern red oak
Ar:				
Arrington	Yellow poplar	100	107	Yellow poplar,
	Black walnut	85	75	black walnut,
	Sweetgum	85	70	sweetgum, white
	White oak	80	62	oak, southern red
	Southern red oak	80	62	oak
BaF:				
Barfield	Eastern redcedar	35	14	Eastern redcedar
Gladdice	Chestnut oak	55	43	Chestnut oak,
	Virginia pine	55	41	Virginia pine,
	Eastern redcedar	40	40	eastern redcedar
Rock outcrop.				
BcD:				
Barfield	Eastern redcedar	40	40	Eastern redcedar
Rock outcrop.				
BeB2:				
Bewleyville	Yellow poplar	90	90	Yellow poplar,
	Shortleaf pine	75	136	shortleaf pine,
	Northern red oak	80	62	northern red oak,
	Southern red oak	70	62	southern red oak,
	White oak	75	57	white oak
BeC2:				
Bewleyville	Yellow poplar	90	90	Yellow poplar,
	Shortleaf pine	75	136	shortleaf pine,
	Northern red oak	80	62	northern red oak,
	Southern red oak	70	62	southern red oak,
	White oak	73	57	white oak

Table 8e.--Forest Productivity--Continued

Map symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site index	Volume of wood fiber	
			cu ft/ac	
CrB2:				
Christian	Shortleaf pine	65	113	Shortleaf pine,
	Yellow poplar	80	71	yellow poplar,
	Virginia pine	65	70	Virginia pine,
	White oak	65	48	white oak,
	Northern red oak	65	48	northern red oak,
	Eastern redcedar	40	40	eastern redcedar
CrC2:				
Christian	Shortleaf pine	65	113	Shortleaf pine,
	Yellow poplar	80	71	yellow poplar,
	Virginia pine	65	70	Virginia pine,
	White oak	65	48	white oak,
	Northern red oak	65	48	northern red oak,
	Eastern redcedar	40	40	eastern redcedar
CrD2:				
Christian	Shortleaf pine	65	113	Shortleaf pine,
	Yellow poplar	80	71	yellow poplar,
	Virginia pine	65	70	Virginia pine,
	White oak	65	48	white oak,
	Northern red oak	65	48	northern red oak,
	Eastern redcedar	40	40	eastern redcedar
DaF:				
Dellrose	Yellow poplar	100	100	Yellow poplar,
	Shortleaf pine	80	114	shortleaf pine,
	Northern red oak	75	57	northern red oak
Mimosa	Virginia pine	65	86	Virginia pine,
	Chestnut oak	70	52	chestnut oak,
	Southern red oak	70	52	southern red oak,
	Eastern redcedar	40	45	eastern redcedar
DeC:				
Dellrose	Yellow poplar	100	100	Yellow poplar,
	Shortleaf pine	80	114	shortleaf pine,
	Northern red oak	75	57	northern red oak
DeD2:				
Dellrose	Yellow poplar	100	100	Yellow poplar,
	Shortleaf pine	80	114	shortleaf pine,
	Northern red oak	75	57	northern red oak
DeE:				
Dellrose	Yellow poplar	100	100	Yellow poplar,
	Shortleaf pine	80	114	shortleaf pine,
	Northern red oak	75	57	northern red oak
DkB2:				
Dickson	Yellow poplar	90	90	Yellow poplar,
	Northern red oak	75	57	white oak,
	White oak	70	57	southern red oak,
	Shortleaf pine	70	125	shortleaf pine
HaD:				
Hawthorne	Eastern redcedar	35	41	Eastern redcedar,
	Virginia pine	55	40	Virginia pine

Table 8e.--Forest Productivity--Continued

Map symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site index	Volume of wood fiber	
			cu ft/ac	
HaF:				
Hawthorne	Eastern redcedar	35	41	Eastern redcedar,
	Virginia pine	55	40	Virginia pine
HdF:				
Hawthorne	Eastern redcedar	35	41	Eastern redcedar,
				Virginia pine
Rock outcrop.				
HoB:				
Holston	Yellow poplar	90	90	Yellow poplar,
	Shortleaf pine	75	136	shortleaf pine,
	Northern red oak	80	62	northern red oak
HoC2:				
Holston	Yellow poplar	90	90	Yellow poplar,
	Shortleaf pine	75	136	shortleaf pine,
	Northern red oak	80	62	northern red oak
HoD2:				
Holston	Yellow poplar	90	90	Yellow poplar,
	Shortleaf pine	75	136	shortleaf pine,
	Northern red oak	80	62	northern red oak
HoD3:				
Holston	Yellow poplar	90	90	Yellow poplar,
	Shortleaf pine	75	136	shortleaf pine,
	Northern red oak	80	62	northern red oak
HuB:				
Humphreys	Yellow poplar	100	107	Yellow poplar,
	Sweetgum	75	86	sweetgum, black
	American sycamore	75	81	walnut, white ash
	Black walnut	85	75	
	White ash	80	75	
HuC:				
Humphreys	Yellow poplar	100	107	Yellow poplar,
	Sweetgum	75	86	sweetgum, black
	American sycamore	75	81	walnut, white ash
	Black walnut	85	75	
	White ash	80	75	
Ld:				
Lindside	Yellow poplar	95	98	Yellow poplar,
	Sweetgum	85	70	sweetgum, white
	White oak	85	62	oak, cherrybark
	Cherrybark oak	80	62	oak, black walnut
	Black walnut	85	55	
MmB2:				
Mimosa	Virginia pine	65	86	Virginia pine,
	Chestnut oak	70	52	chestnut oak,
	Southern red oak	70	52	southern red oak,
	Eastern redcedar	40	45	eastern redcedar

Table 8e.--Forest Productivity--Continued

Map symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site index	Volume of wood fiber	
			cu ft/ac	
MmC2:				
Mimosa	Virginia pine	65	86	Virginia pine,
	Chestnut oak	70	52	chestnut oak,
	Southern red oak	70	52	southern red oak,
	Eastern redcedar	40	45	eastern redcedar
MmD2:				
Mimosa	Virginia pine	65	86	Virginia pine,
	Chestnut oak	70	52	chestnut oak,
	Southern red oak	70	52	southern red oak,
	Eastern redcedar	40	45	eastern redcedar
Mn:				
Minter	Sweetgum	100	98	Sweetgum, swamp
	Swamp white oak	80	43	white oak,
	Cherrybark oak	80	43	cherrybark oak,
	Green ash	78	43	green ash
MtB2:				
Mountview	Shortleaf pine	65	113	Shortleaf pine,
	Yellow poplar	75	90	yellow poplar,
	Southern red oak	70	57	southern red oak,
	White oak	70	52	white oak
MtC2:				
Mountview	Shortleaf pine	65	113	Shortleaf pine,
	Yellow poplar	75	90	yellow poplar,
	Southern red oak	70	57	southern red oak,
	White oak	70	52	white oak
Oc:				
Ocana	Yellow poplar	100	107	Yellow poplar,
	American sycamore	85	80	sweetgum, American
	Sweetgum	85	85	sycamore,
	Cherrybark oak	80	62	cherrybark oak,
	White oak	75	57	white oak
Sk:				
Skidmore	Yellow poplar	100	107	Yellow poplar,
	Sweetgum	85	85	sweetgum, American
	American sycamore	85	80	sycamore,
	Cherrybark oak	80	62	cherrybark oak,
	White oak	75	57	white oak
St:				
Staser	Yellow poplar	100	107	Yellow poplar,
	Cweetgum	95	93	sweetgum, black
	Black walnut	85	72	walnut, cherrybark
	Cherrybark oak	85	62	oak, white oak
	White oak	80	62	
SuC2:				
Sugargrove	Shortleaf pine	60	79	Shortleaf pine,
	Virginia pine	55	55	Virginia pine,
	Chestnut oak	50	41	chestnut oak,
	Eastern redcedar	45	45	eastern redcedar

Table 8e.--Forest Productivity--Continued

Map symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site index	Volume of wood fiber	
			cu ft/ac	
SuD2:				
Sugargrove	Shortleaf pine	60	79	Shortleaf pine,
	Virginia pine	55	55	Virginia pine,
	Chestnut oak	50	41	chestnut oak,
	Eastern redcedar	45	45	eastern redcedar
SwB:				
Swafford	Shortleaf pine	80	148	Shortleaf pine,
	Sweetgum	85	107	sweetgum, yellow
	Yellow poplar	95	98	poplar, cherrybark
	Cherrybark oak	80	70	oak, northern red
	Northern red oak	80	62	oak
SwC:				
Swafford	Shortleaf pine	80	148	Shortleaf pine,
	Sweetgum	85	107	sweetgum, yellow
	Yellow poplar	95	98	poplar, cherrybark
	Cherrybark oak	80	70	oak, northern red
	Northern red oak	80	62	oak
SyB2:				
Sykes	Yellow poplar	100	107	Yellow poplar,
	Shortleaf pine	90	144	shortleaf pine,
	Black walnut	85	75	black walnut,
	White oak	80	62	white oak,
	Southern red oak	80	62	southern red oak
SyC2:				
Sykes	Yellow poplar	100	107	Yellow poplar,
	Loblolly pine	90	144	shortleaf pine,
	Black walnut	85	75	black walnut,
	White oak	80	62	white oak,
	Southern red oak	80	62	southern red oak
Ud:				
Udarents.				

Table 9.--Recreational Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AmB:					
Armour	Slight	Slight	Moderate: slope	Slight	Slight
AmC2:					
Armour	Moderate: slope	Moderate: slope	Severe: slope	Severe: erodes easily	Moderate: slope
AmD2:					
Armour	Severe: slope	Severe: slope	Severe: slope	Severe: erodes easily	Moderate: slope
Ar:					
Arrington	Severe: flooding	Slight	Moderate: flooding	Slight	Moderate: flooding
BaF:					
Barfield	Severe: slope	Severe: slope	Severe: slope depth to rock	Severe: too clayey	Severe: slope too clayey depth to rock
Gladdice	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope too clayey
Rock outcrop.					
BcD:					
Barfield	Severe: depth to rock too clayey	Severe: depth to rock too clayey	Severe: slope depth to rock	Severe too clayey	Severe: depth to rock too clayey
Rock outcrop.					
BeB2:					
Bewleyville	Slight	Slight	Moderate: slope	Slight	Slight
BeC2:					
Bewleyville	Moderate: slope	Moderate: slope	Severe: slope	Severe: erodes easily	Moderate: slope
CrB2:					
Christian	Slight:	Slight:	Moderate: slope small stones	Slight	Slight:
CrC2:					
Christian	Moderate: slope small stones	Moderate: small stones	Severe: slope small stones	Slight	Moderate: slope
CrD2:					
Christian	Severe: slope	Severe: slope	Severe: slope small stones	Severe: erodes easily	Severe: slope

Table 9.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
DaF:					
Dellrose	Severe: slope	Severe: slope	Severe: slope small stones	Severe: slope	Severe: slope
DaF:					
Mimosa	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
DeC:					
Dellrose	Moderate: slope small stones	Moderate: slope small stones	Severe: slope small stones	Slight	Moderate: large stones slope small stones
DeD2:					
Dellrose	Severe: slope	Severe: slope	Severe: slope small stones	Moderate: slope	Severe: slope
DeE:					
Dellrose	Severe: slope	Severe: slope	Severe: slope small stones	Severe: slope	Severe: slope
DkB2:					
Dickson	Moderate: percs slowly wetness	Moderate: percs slowly wetness	Moderate: percs slowly slope wetness	Severe: erodes easily	Slight
DkC2:					
Dickson	Moderate: percs slowly slope wetness	Moderate: percs slowly slope wetness	Severe: slope	Severe: erodes easily	Moderate: slope
HaD:					
Hawthorne	Moderate: slope small stones	Moderate: slope small stones	Severe: slope small stones	Moderate slope	Moderate: slope small stones
HaF:					
Hawthorne	Moderate: slope	Moderate: slope	Severe: slope	Severe slope	Severe: slope
HdF:					
Hawthorne	Severe: slope	Severe: slope	Severe: slope	Severe	Severe: slope
Rock outcrop.					
HoB:					
Holston	Slight	Slight	Moderate: slope small stones	Slight	Slight
HoC2:					
Holston	Moderate: slope	Moderate: slope	Severe: slope	Slight	Moderate: slope

Table 9.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
HoD2:					
Holston	Severe: slope	Severe: slope	Severe: slope	Moderate: slope	Severe: slope
HoD3:					
Holston	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
HuB:					
Humphreys	Moderate: small stones	Moderate: small stones	Severe: small stones	Slight	Moderate: small stones droughty
HuC:					
Humphreys	Moderate: slope small stones	Moderate: slope small stones	Severe: slope small stones	Slight	Moderate: small stones droughty
Ld:					
Lindside	Severe: flooding	Moderate: percs slowly wetness	Moderate: flooding wetness	Moderate: wetness	Moderate: flooding wetness
MmB2:					
Mimosa	Moderate: percs slowly	Moderate: percs slowly	Moderate: percs slowly slope	Slight	Slight
MmC2:					
Mimosa	Moderate: percs slowly slope	Moderate: percs slowly slope	Severe: slope	Slight	Moderate: slope
MmD2:					
Mimosa	Severe: slope	Severe: slope	Severe: slope	Severe: erodes easily	Severe: slope
Mn:					
Minter	Severe: flooding wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
MtB2:					
Mountview	Slight	Slight	Moderate: slope	Severe: erodes easily	Slight
MtC2:					
Mountview	Moderate: slope	Moderate: slope	Severe: slope	Severe: erodes easily	Moderate: slope
Oc:					
Ocana	Severe: flooding	Moderate: small stones	Severe: small stones	Slight	Moderate: flooding large stones small stones
Sk:					
Skidmore	Severe: flooding	Slight	Moderate: flooding small stones	Slight	Moderate: flooding droughty

Table 9.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
St:					
Staser	Severe: flooding	Slight	Moderate: flooding	Slight	Moderate: flooding
SuC2:					
Sugargrove	Moderate: slope small stones	Moderate: slope small stones	Severe: slope small stones	Slight	Moderate: slope small stones
SuD2:					
Sugargrove	Severe: slope	Severe: slope	Severe: slope small stones	Moderate: slope	Severe: slope
SwB:					
Swafford	Moderate: percs slowly wetness	Moderate: percs slowly wetness	Moderate: slope small stones wetness	Slight	Slight
SwC:					
Swafford	Moderate: percs slowly wetness	Moderate: percs slowly wetness	Moderate: slope small stones wetness	Slight	Slight
SyB2:					
Sykes	Moderate: percs slowly	Moderate: percs slowly	Moderate: percs slowly slope small stones	Severe: erodes easily	Slight
SyC2:					
Sykes	Moderate: percs slowly slope	Moderate: percs slowly slope	Severe: slope	Severe: erodes easily	Moderate: slope
Ud:					
Udarents.					

Table 10.--Wildlife Habitat

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
AmB:											
Armour	Good	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
AmC2:											
Armour	Fair	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
AmD2:											
Armour	Fair	Good	Good	Good	Good	Fair	Very poor	Very poor	Good	Good	Very poor
Ar:											
Arrington	Good	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
BaF:											
Barfield	Poor	Poor	Fair	Poor	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor
Gladdice	Very poor	Fair	Poor	Good	Poor	Poor	Very poor	Very poor	Poor	Good	Very poor
Rock outcrop.											
BcD:											
Barfield	Poor	Poor	Fair	Poor	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor
Rock outcrop.											
BeB2:											
Bewleyville	Good	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
BeC2:											
Bewleyville	Fair	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
CrB2:											
Christian	Good	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
CrC2:											
Christian	Fair	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
CrD2:											
Christian	Poor	Fair	Good	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor
DaF:											
Dellrose	Very poor	Fair	Good	Good	Good	Fair	Very poor	Very poor	Fair	Good	Very poor
Mimosa	Very poor	Fair	Good	Good	Good	Fair	Very poor	Very poor	Fair	Good	Very poor

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
DeC:											
Dellrose	Fair	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
DeD2:											
Dellrose	Poor	Fair	Good	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor
DeE:											
Dellrose	Very poor	Poor	Good	Good	Good	Fair	Very poor	Very poor	Poor	Good	Very poor
DkB2:											
Dickson	Good	Good	Good	Good	Poor	Good	Poor	Very poor	Good	Good	Very poor
DkC2:											
Dickson	Fair	Good	Good	Good	Poor	Good	Poor	Very poor	Good	Good	Very poor
HaD:											
Hawthorne	Poor	Fair	Fair	Fair	Fair	Poor	Very poor	Very poor	Fair	Fair	Very poor
HaF:											
Hawthorne	Poor	Fair	Fair	Fair	Fair	Poor	Very poor	Very poor	Fair	Fair	Very poor
HdF:											
Hawthorne	Poor	Fair	Fair	Fair	Fair	Poor	Very poor	Very poor	Fair	Fair	Very poor
Rock outcrop.											
HoB:											
Holston	Good	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
HoC2:											
Holston	Fair	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
HoD2:											
Holston	Poor	Fair	Good	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor
HoD3:											
Holston	Poor	Fair	Good	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor
HuB:											
Humphreys	Good	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
HuC:											
Humphreys	Fair	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
Ld:											
Lindside	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor

Table 10.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
MmB2:											
Mimosa	Good	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
MmC2:											
Mimosa	Fair	Good	Good	Good	Good	Fair	Very poor	Very poor	Good	Good	Very poor
MmD2:											
Mimosa	Poor	Fair	Good	Good	Good	Poor	Very poor	Very poor	Fair	Good	Very poor
Mn:											
Minter	Poor	Fair	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good
MtB2:											
Mountview	Good	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Poor
MtC2:											
Mountview	Fair	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Poor
Oc:											
Ocana	Good	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Poor
Sk:											
Skidmore	Fair	Good	Good	Fair	Fair	Poor	Poor	Very poor	Good	Fair	Very poor
St:											
Staser	Poor	Fair	Fair	Good	Good	Good	Poor	Very poor	Fair	Good	Very poor
SuC2:											
Sugargrove	Fair	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
SuD2:											
Sugargrove	Poor	Fair	Good	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor
SwB:											
Swafford	Good	Good	Good	Good	Poor	Good	Poor	Poor	Good	Good	Poor
SwC:											
Swafford	Good	Good	Good	Good	Poor	Good	Poor	Poor	Good	Good	Poor
SyB2:											
Sykes	Good	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
SyC2:											
Sykes	Fair	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
Ud:											
Udarents.											

Table 11.--Building Site Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AmB:						
Armour	Slight	Slight	Slight	Slight	Severe: low strength	Slight
AmC2:						
Armour	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Severe: low strength	Moderate: slope
AmD2:						
Armour	Moderate: slope	Severe: slope	Severe: slope	Severe: slope	Severe: low strength slope	Severe: slope
Ar:						
Arrington	Moderate: flooding wetness	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Moderate: flooding
BaF:						
Barfield	Severe: slope depth to rock	Severe: shrink-swell slope depth to rock	Severe: shrink-swell slope depth to rock	Severe: shrink-swell slope depth to rock	Severe: low strength shrink-swell depth to rock	Severe: slope too clayey depth to rock
Gladdice	Severe: slope depth to rock	Severe: shrink-swell slope	Severe: shrink-swell slope depth to rock	Severe: shrink-swell slope	Severe: low strength shrink-swell slope	Severe: slope too clayey
Rock outcrop.						
BcD:						
Barfield	Severe: depth to rock	Severe: shrink-swell depth to rock	Severe: shrink-swell depth to rock	Severe: shrink-swell slope depth to rock	Severe: low strength shrink-swell depth to rock	Severe: too clayey depth to rock
Rock outcrop.						
BeB2:						
Bewleyville	Moderate: too clayey	Slight	Slight	Slight	Severe: low strength	Slight
BeC2:						
Bewleyville	Moderate: slope too clayey	Moderate: slope	Moderate: slope	Severe: slope	Severe: low strength	Moderate: slope
CrB2:						
Christian	Moderate: too clayey	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: low strength shrink-swell	Slight
CrC2:						
Christian	Moderate: slope too clayey	Moderate: shrink-swell slope	Moderate: shrink-swell slope	Severe: slope	Moderate: low strength shrink-swell slope	Moderate: slope

Table 11.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
CrD2:						
Christian	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
DaF:						
Dellrose	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
Mimosa	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: low strength slope	Severe: slope
DeC:						
Dellrose	Moderate: slope too clayey	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope	Moderate: large stones slope small stones
DeD2:						
Dellrose	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
DeE:						
Dellrose	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
DkB2:						
Dickson	Severe: wetness	Moderate: wetness	Severe: wetness	Moderate: wetness	Severe: low strength	Slight
DkC2:						
Dickson	Severe: wetness	Moderate: wetness	Severe: wetness	Moderate: slope	Severe: low strength	Slight
HaD:						
Hawthorne	Moderate: slope depth to rock	Severe: slope	Severe: slope depth to rock	Severe: slope	Severe: slope	Severe: slope small stones
HaF:						
Hawthorne	Severe: slope depth to rock	Severe: slope	Severe: slope depth to rock	Severe: slope	Severe: slope	Severe: slope
HdF:						
Hawthorne	Severe: slope depth to rock	Severe: slope	Severe: slope depth to rock	Severe: slope	Severe: slope	Severe: slope
Rock outcrop.						
HoB:						
Holston	Slight	Slight	Slight	Slight	Slight	Slight
HoC2:						
Holston	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope
HoD2:						
Holston	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope

Table 11.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
HoD3:						
Holston	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
HuB:						
Humphreys	Moderate: wetness	Slight	Moderate: wetness	Slight	Slight	Moderate: small stones
HuC:						
Humphreys	Moderate: slope wetness	Moderate: slope	Moderate: slope wetness	Moderate: slope	Moderate: slope	Moderate: small stones
Ld:						
Lindside	Severe: wetness	Severe: flooding	Severe: flooding wetness	Severe: flooding	Severe: flooding low strength	Moderate: flooding wetness
MmB2:						
Mimosa	Moderate: too clayey depth to rock	Moderate: shrink-swell	Moderate: shrink-swell depth to rock	Moderate: shrink-swell	Severe: low strength	Slight
MmC2:						
Mimosa	Moderate: slope too clayey depth to rock	Moderate: shrink-swell slope	Moderate: shrink-swell slope depth to rock	Severe: slope	Severe: low strength	Moderate: slope
MmD2:						
Mimosa	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: low strength slope	Severe: slope
Mn:						
Minter	Severe: wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding low strength wetness	Severe: wetness
MtB2:						
Mountview	Moderate: too clayey	Moderate: wetness	Moderate: shrink-swell wetness	Moderate: wetness	Severe: low strength	Slight
MtC2:						
Mountview	Moderate: slope too clayey	Moderate: slope wetness	Moderate: shrink-swell slope wetness	Severe: slope	Severe: low strength	Moderate: slope
Oc:						
Ocana	Moderate: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Moderate: flooding large stones small stones

Table 11.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Sk:						
Skidmore	Moderate: flooding wetness	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding droughty
St:						
Staser	Moderate: flooding wetness	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Moderate: flooding
SuC2:						
Sugargrove	Moderate: slope depth to rock	Moderate: slope	Moderate: slope depth to rock	Severe: slope	Moderate: slope	Moderate: slope small stones
SuD2:						
Sugargrove	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
SwB:						
Swafford	Severe: wetness	Moderate: wetness	Severe: wetness	Moderate: wetness	Moderate: low strength wetness	Slight
SwC:						
Swafford	Severe: wetness	Moderate: slope wetness	Severe: wetness	Severe: slope	Moderate: low strength wetness	Slight
SyB2:						
Sykes	Moderate: too clayey	Slight	Moderate: shrink-swell	Slight	Severe: low strength	Slight
SyC2:						
Sykes	Moderate: slope too clayey	Moderate: slope	Moderate: shrink-swell slope	Severe: slope	Severe: low strength	Moderate: slope
Ud:						
Udarents.						

Table 12.--Sanitary Facilities

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AmB:					
Armour	Moderate: percs slowly	Moderate: seepage slope	Moderate: too clayey	Slight	Fair: thin layer too clayey
AmC2:					
Armour	Moderate: percs slowly slope	Severe: slope	Moderate: slope too clayey	Moderate: slope	Fair: slope thin layer too clayey
AmD2:					
Armour	Severe: percs slowly slope	Severe: slope	Severe: slope too clayey	Severe: slope	Poor: slope
Ar:					
Arrington	Severe: flooding	Severe: flooding	Severe: flooding wetness	Severe: flooding	Good
BaF:					
Barfield	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope too clayey depth to rock	Severe: slope depth to rock	Poor: hard to pack too clayey depth to rock
Gladdice	Severe: percs slowly slope depth to rock	Severe: slope depth to rock	Severe: slope too clayey depth to rock	Severe: slope depth to rock	Poor: hard to pack too clayey depth to rock
Rock outcrop.					
BcD:					
Barfield	Severe: depth to rock	Severe: slope depth to rock	Severe: too clayey depth to rock	Severe: depth to rock	Poor: hard to pack too clayey depth to rock
Rock outcrop.					
BeB2:					
Bewleyville	Moderate: percs slowly	Moderate: seepage slope	Severe: too clayey	Slight	Poor: hard to pack too clayey
BeC2:					
Bewleyville	Moderate: percs slowly slope	Severe: slope	Severe: too clayey	Moderate: slope	Poor: hard to pack too clayey
CrB2:					
Christian	Severe: percs slowly	Moderate: slope	Severe: too clayey	Slight	Poor: small stones

Table 12.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
CrC2:					
Christian	Severe: percs slowly slope	Severe: slope	Severe: too clayey	Moderate: slope	Poor: small stones
CrD2:					
Christian	Severe: percs slowly slope	Severe: slope	Severe: slope too clayey	Severe: slope	Poor: slope small stones
DaF:					
Dellrose	Severe: slope	Severe: seepage slope	Severe: slope	Severe: seepage slope	Poor: slope small stones
Mimosa	Severe: percs slowly slope	Severe: slope	Severe: slope too clayey depth to rock	Severe: slope	Poor: hard to pack slope too clayey
DeC:					
Dellrose	Moderate: slope	Severe: seepage slope	Moderate: slope too clayey	Severe: seepage	Poor: small stones
DeD2:					
Dellrose	Severe: slope	Severe: seepage slope	Severe: slope	Severe: seepage slope	Poor: slope small stones
DeE:					
Dellrose	Severe: slope	Severe: seepage slope	Severe: slope	Severe: seepage slope	Poor: slope small stones
DkB2:					
Dickson	Severe: percs slowly wetness	Severe: wetness	Moderate: too clayey wetness	Severe: wetness	Fair: too clayey wetness
DkC2:					
Dickson	Severe: percs slowly wetness	Severe: slope wetness	Moderate: slope too clayey wetness	Severe: slope wetness	Fair: slope too clayey wetness
HaD:					
Hawthorne	Severe: depth to rock	Severe: seepage slope depth to rock	Severe: seepage slope depth to rock	Severe: seepage slope depth to rock	Poor: slope small stones depth to rock
HaF:					
Hawthorne	Severe: slope depth to rock	Severe: seepage slope depth to rock	Severe: seepage slope depth to rock	Severe: seepage slope depth to rock	Poor: slope small stones depth to rock
HdF:					
Hawthorne	Severe: slope depth to rock	Severe: seepage slope depth to rock	Severe: seepage slope depth to rock	Severe: seepage slope depth to rock	Poor: slope small stones depth to rock

Table 12.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
HdF:					
Rock outcrop.					
HoB:					
Holston	Slight	Moderate: seepage slope	Slight	Slight	Fair: small stones
HoC2:					
Holston	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope	Fair: slope small stones
HoD2:					
Holston	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Poor: slope
HoD3:					
Holston	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Poor: slope
HuB:					
Humphreys	Moderate: wetness	Severe: seepage	Severe: seepage wetness	Severe: seepage	Poor: small stones
HuC:					
Humphreys	Moderate: slope wetness	Severe: seepage slope	Severe: seepage wetness	Severe: seepage	Poor: small stones
Ld:					
Lindside	Severe: flooding percs slowly wetness	Severe: flooding seepage wetness	Severe: flooding seepage wetness	Severe: flooding wetness	Fair: too clayey wetness
MmB2:					
Mimosa	Severe: percs slowly	Moderate: slope depth to rock	Severe: too clayey depth to rock	Moderate: depth to rock	Poor: hard to pack too clayey
MmC2:					
Mimosa	Severe: percs slowly	Severe: slope	Severe: too clayey depth to rock	Moderate: slope depth to rock	Poor: hard to pack too clayey
MmD2:					
Mimosa	Severe: percs slowly slope	Severe: slope	Severe: slope too clayey depth to rock	Severe: slope	Poor: hard to pack slope too clayey
Mn:					
Minter	Severe: flooding percs slowly wetness	Severe: flooding	Severe: flooding too clayey wetness	Severe: flooding wetness	Poor: hard to pack too clayey wetness

Table 12.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
MtB2:					
Mountview	Moderate: percs slowly	Moderate: seepage slope	Severe: too clayey	Slight	Poor: hard to pack small stones too clayey
MtC2:					
Mountview	Moderate: percs slowly slope	Severe: slope	Severe: too clayey	Moderate: slope	Poor: hard to pack small stones too clayey
Oc:					
Ocana	Severe: flooding	Severe: flooding seepage	Severe: flooding seepage	Severe: flooding seepage	Poor: small stones
Sk:					
Skidmore	Severe: flooding wetness	Severe: flooding seepage wetness	Severe: flooding seepage depth to rock	Severe: flooding seepage wetness	Poor: seepage small stones
St:					
Staser	Severe: flooding wetness	Severe: flooding seepage wetness	Severe: flooding seepage wetness	Severe: flooding seepage wetness	Good
SuC2:					
Sugargrove	Moderate: slope depth to rock	Severe: seepage slope	Severe: seepage depth to rock	Severe: seepage	Poor: small stones
SuD2:					
Sugargrove	Severe: slope	Severe: seepage slope	Severe: seepage slope depth to rock	Severe: seepage slope	Poor: slope small stones
SwB:					
Swafford	Severe: percs slowly wetness	Severe: wetness	Moderate: too clayey wetness	Moderate: wetness	Fair: too clayey wetness
SwC:					
Swafford	Severe: percs slowly wetness	Severe: wetness	Moderate: too clayey wetness	Moderate: wetness	Fair: too clayey wetness
SyB2:					
Sykes	Severe: percs slowly	Moderate: seepage slope	Severe: too clayey	Slight	Poor: hard to pack too clayey
SyC2:					
Sykes	Severe: percs slowly	Severe: slope	Severe: too clayey	Moderate: slope	Poor: hard to pack too clayey
Ud:					
Udarents.					

Table 13.--Construction Materials

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
AmB:				
Armour	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
AmC2:				
Armour	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: slope too clayey
AmD2:				
Armour	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: slope too clayey
Ar:				
Arrington	Fair: low strength thin layer	Improbable: excess fines	Improbable: excess fines	Good
BaF:				
Barfield	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: small stones too clayey depth to rock
Gladdice	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope too clayey
Rock outcrop.				
BcD:				
Barfield	Poor: low strength shrink-swell depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: small stones too clayey depth to rock
Rock outcrop.				
BeB2:				
Bewleyville	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: thin layer too clayey
BeC2:				
Bewleyville	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: slope thin layer too clayey
CrB2:				
Christian	Fair: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey

Table 13.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
CrC2:				
Christian	Fair: low strength, shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
CrD2:				
Christian	Fair: low strength, shrink-swell, slope	Improbable: excess fines	Improbable: excess fines	Poor: slope, too clayey
DaF:				
Dellrose	Poor: slope	Improbable: excess fines	Improbable: excess fines	Poor: slope, small stones
Mimosa	Poor: shrink-swell, slope	Improbable: excess fines	Improbable: excess fines	Poor: slope, too clayey
DeC:				
Dellrose	Fair: thin layer	Improbable: excess fines	Improbable: excess fines	Fair: small stones
DeD2:				
Dellrose	Fair: slope, thin layer	Improbable: excess fines	Improbable: excess fines	Poor: slope, small stones
DeE:				
Dellrose	Poor: slope	Improbable: excess fines	Improbable: excess fines	Poor: slope, small stones
DkB2:				
Dickson	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: thin layer
DkC2:				
Dickson	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: thin layer
HaD:				
Hawthorne	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope, small stones
HaF:				
Hawthorne	Poor: slope, depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope, small stones
HdF:				
Hawthorne	Poor: slope, depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope, small stones
Rock outcrop.				
HoB:				
Holston	Good	Improbable: excess fines	Improbable: excess fines	Poor: small stones

Table 13.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
HoC2:				
Holston	Good	Improbable: excess fines	Improbable: excess fines	Poor: small stones
HoD2:				
Holston	Fair: slope	Improbable: excess fines	Improbable: excess fines	Poor: slope small stones
HoD3:				
Holston	Fair: slope	Improbable: excess fines	Improbable: excess fines	Poor: slope small stones
HuB:				
Humphreys	Good	Improbable: excess fines	Improbable: excess fines	Poor: small stones
HuC:				
Humphreys	Good	Improbable: excess fines	Improbable: excess fines	Poor: small stones
Ld:				
Lindside	Fair: wetness	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
MmB2:				
Mimosa	Poor: shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
MmC2:				
Mimosa	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: shrink-swell
MmD2:				
Mimosa	Poor: shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: slope too clayey
Mn:				
Minter	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
MtB2:				
Mountview	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
MtC2:				
Mountview	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Oc:				
Ocana	Good	Improbable: excess fines	Improbable: excess fines	Poor: small stones
Sk:				
Skidmore	Fair: large stones	Improbable: small stones	Probable	Poor: large stones small stones
St:				
Staser	Good	Improbable: excess fines	Improbable: excess fines	Good

Table 13.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
SuC2:				
Sugargrove	Fair: thin layer depth to rock	Improbable: excess fines	Improbable: excess fines	Fair: small stones thin layer depth to rock
SuD2:				
Sugargrove	Fair: slope thin layer depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope
SwB:				
Swafford	Fair: low strength wetness	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
SwC:				
Swafford	Fair: low strength wetness	Improbable: excess fines	Improbable: excess fines	Fair: slope too clayey
SyB2:				
Sykes	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: thin layer too clayey
SyC2:				
Sykes	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: slope thin layer too clayey
Ud:				
Udarents.				

Table 14.--Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
AmB:							
Armour	Moderate: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily	Limitation: erodes easily
AmC2:							
Armour	Severe: slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily slope	Limitation: erodes easily slope
AmD2:							
Armour	Severe: slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily slope	Limitation: erodes easily slope
Ar:							
Arrington	Moderate: seepage	Severe: piping	Moderate: slow refill deep to water	Limitation: deep to water	Limitation: erodes easily flooding	Limitation: erodes easily	Limitation: erodes easily
BaF:							
Barfield	Severe: slope depth to rock	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: slope slow intake droughty	Limitation: slope depth to rock	Limitation: slope depth to rock droughty
Gladdice	Severe: slope	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
Rock outcrop.							
BcD:							
Barfield	Severe: slope depth to rock	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: slope droughty	Limitation: slope depth to rock	Limitation: slope depth to rock droughty
Rock outcrop.							

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
BeB2:							
Bewleyville	Moderate: seepage slope	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily	Limitation: erodes easily
BeC2:							
Bewleyville	Severe: slope	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily slope	Limitation: erodes easily slope
CrB2:							
Christian	Moderate: seepage slope	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily	Limitation: erodes easily
CrC2:							
Christian	Severe: slope	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily slope	Limitation: erodes easily slope
CrD2:							
Christian	Severe: slope	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily slope	Limitation: erodes easily slope
DaF:							
Dellrose	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: slope	Limitation: slope
Mimosa	Severe: slope	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly slope	Limitation: erodes easily percs slowly slope	Limitation: erodes easily percs slowly slope
DeC:							
Dellrose	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: slope	Limitation: slope
DeD2:							
Dellrose	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: slope	Limitation: slope

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
DeE:							
Dellrose	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: slope	Limitation: slope
DkB2:							
Dickson	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: percs slowly slope	Limitation: percs slowly rooting depth wetness	Limitation: erodes easily wetness	Limitation: erodes easily rooting depth
DkC2:							
Dickson	Severe: slope	Severe: piping	Severe: no water	Limitation: percs slowly slope	Limitation: percs slowly rooting depth wetness	Limitation: erodes easily slope wetness	Limitation: erodes easily rooting depth slope
HaD:							
Hawthorne	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock droughty	Limitation: slope depth to rock	Limitation: slope depth to rock droughty
HaF:							
Hawthorne	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock droughty	Limitation: slope depth to rock	Limitation: slope depth to rock droughty
HdF:							
Hawthorne	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock droughty	Limitation: slope depth to rock	Limitation: slope depth to rock droughty
Rock outcrop.							
HoB:							
Holston	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Favorable	Favorable
HoC2:							
Holston	Severe: slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: slope	Limitation: slope

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
HoD2:							
Holston	Severe: slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: slope	Limitation: slope
HoD3:							
Holston	Severe: slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: slope	Limitation: slope
HuB:							
Humphreys	Severe: seepage	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope droughty	Favorable	Limitation: droughty
HuC:							
Humphreys	Severe: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope droughty	Limitation: slope	Limitation: slope droughty
Ld:							
Lindside	Severe: seepage	Severe: piping wetness	Severe: slow refill	Limitation: flooding	Limitation: flooding wetness	Limitation: erodes easily wetness	Limitation: erodes easily
MmB2:							
Mimosa	Moderate: slope depth to rock	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly slope	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly
MmC2:							
Mimosa	Severe: slope	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly slope	Limitation: erodes easily percs slowly slope	Limitation: erodes easily percs slowly slope
MmD2:							
Mimosa	Severe: slope	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: erodes easily percs slowly slope	Limitation: erodes easily percs slowly slope	Limitation: erodes easily percs slowly slope

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Mn:							
Minter	Slight	Severe: wetness	Severe: slow refill	Limitation: flooding percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
MtB2:							
Mountview	Moderate: seepage slope	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily	Limitation: erodes easily
MtC2:							
Mountview	Severe: slope	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily slope	Limitation: erodes easily slope
Oc:							
Ocana	Severe: seepage	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: flooding	Favorable	Favorable
Sk:							
Skidmore	Severe: seepage	Severe: seepage	Moderate: deep to water	Limitation: deep to water	Limitation: flooding droughty	Limitation: large stones	Limitation: large stones droughty
St:							
Staser	Severe: seepage	Severe: piping	Moderate: slow refill deep to water	Limitation: deep to water	Limitation: flooding	Favorable	Favorable
SuC2:							
Sugargrove	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: slope small stones	Limitation: slope small stones
SuD2:							
Sugargrove	Severe: seepage slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: slope small stones	Limitation: large stones slope
SwB:							
Swafford	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: slope	Limitation: erodes easily slope wetness	Limitation: erodes easily wetness	Limitation: erodes easily

Table 14.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
SwC:							
Swafford	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: slope	Limitation: erodes easily slope wetness	Limitation: erodes easily wetness	Limitation: erodes easily
SyB2:							
Sykes	Moderate: seepage slope	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily	Limitation: erodes easily
SyC2:							
Sykes	Severe: slope	Severe: hard to pack	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily slope	Limitation: erodes easily slope
Ud:							
Udarents.							

Table 15.--Engineering Index Properties

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
AmB:												
Armour----------	0-13	Silt loam	CL-ML, CL, ML	A-4	0	0	90-100	80-100	75-95	70-90	25-35	5-10
	13-80	Silty clay loam, silt loam	CL	A-4, A-6	0	0	90-100	80-100	75-95	70-95	30-40	8-18
AmC2:												
Armour----------	0-9	Silt loam	CL-ML, CL, ML	A-4	0	0	90-100	80-100	75-95	70-90	25-35	5-10
	9-80	Silty clay loam, silt loam	CL	A-4, A-6	0	0	90-100	80-100	75-95	70-95	30-40	8-18
AmD2:												
Armour----------	0-9	Silt loam	CL-ML, CL, ML	A-4	0	0	90-100	80-100	75-95	70-90	25-35	5-10
	9-80	Silty clay loam, silt loam	CL	A-4, A-6	0	0	90-100	80-100	75-95	70-95	30-40	8-18
Ar:												
Arrington-------	0-37	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	90-100	85-95	75-95	25-40	4-15
	37-55	Silty clay loam, silt loam	CL, CL-ML, ML	A-4, A-6	0	0	95-100	90-100	85-100	75-95	25-40	4-15
	55-80	Silt loam, silty clay loam	CL, MH, ML	A-4, A-6, A-7	0	0	85-100	75-100	65-95	55-95	28-55	8-25
BaF:												
Barfield--------	0-4	Silty clay, silty clay loam	CH, CL, MH	A-6, A-7	0-5	0-10	90-100	85-95	80-90	75-85	35-65	12-35
	4-18	Clay	CH, CL, MH	A-6, A-7	0	0	70-100	65-90	60-85	55-80	35-70	14-40
	18-22	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Gladdice--------	0-6	Silty clay loam	CL, CL-ML	A-6, A-4, A-7	0	0-15	95-100	90-100	85-100	70-95	25-49	6-22
	6-13	Silty clay loam, silty clay, clay	CH, MH, CL	A-7	0	0-15	95-100	90-100	85-100	75-95	45-72	20-40
	13-30	Clay, silty clay	CH, MH	A-7	0	0-15	95-100	90-100	85-100	75-95	51-75	20-40
	30-34	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
BaF:												
Rock outcrop.												
BcD:												
Barfield--------	0-4	Silty clay, silty clay loam	CL, CH, MH	A-6, A-7	0-5	0-10	90-100	85-95	80-90	75-85	35-65	12-35
	4-18	Clay	CH, CL, MH	A-6, A-7	0	0	70-100	65-90	60-85	55-80	35-70	14-40
	18-22	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												
BeB2:												
Bewleyville-----	0-6	Silt loam	CL-ML, ML	A-4	0	0	100	95-100	95-100	85-100	20-30	2-7
	6-26	Silty clay loam, silt loam	CL	A-6, A-7	0	0	95-100	95-100	90-100	85-100	30-45	11-22
	26-80	Clay, clay loam, silty clay loam	CL, CH, MH, ML	A-6, A-7	---	0-5	75-100	75-100	70-95	60-95	35-65	12-32
BeC2:												
Bewleyville-----	0-6	Silt loam	CL-ML, ML	A-4	0	0	100	95-100	95-100	85-100	20-30	2-7
	6-26	Silty clay loam, silt loam	CL	A-6, A-7	0	0	95-100	95-100	90-100	85-100	30-45	11-22
	26-80	Clay, clay loam, silty clay loam	CL, MH, CH, ML	A-6, A-7	---	0-5	75-100	75-100	70-95	60-95	35-65	12-32
CrB2:												
Christian-------	0-7	Silt loam	CL-ML, ML	A-4	---	0	85-100	85-100	70-95	40-85	15-30	NP-7
	7-17	Silty clay loam, gravelly silty clay loam	GC, CL, ML, SC	A-4, A-6	---	0	70-100	50-100	40-100	36-95	20-40	2-20
	17-61	Clay, silty clay loam, gravelly clay	CH, SC, CL, GC	A-7	---	0	70-100	50-100	45-100	40-90	41-70	20-42
	61-80	Clay, clay loam, gravelly clay	CL, GC, CH, SC	A-7	---	0-3	70-100	50-100	45-100	40-90	41-70	20-42

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
CrC2:												
Christian-------	0-7	Silt loam	CL-ML, ML	A-4	---	0	85-100	85-100	70-95	40-85	15-30	NP-7
	7-17	Silty clay loam, gravelly silty clay loam	GC, ML, CL, SC	A-4, A-6	---	0	70-100	50-100	40-100	36-95	20-40	2-20
	17-61	Clay, silty clay loam, gravelly clay	CL, CH, GC, SC	A-7	---	0	70-100	50-100	45-100	40-90	41-70	20-42
	61-80	Clay, clay loam, gravelly clay	CH, CL, SC, GC	A-7	---	0-3	70-100	50-100	45-100	40-90	41-70	20-42
CrD2:												
Christian-------	0-7	Silt loam	CL-ML, ML	A-4	---	0	85-100	85-100	70-95	40-85	15-30	NP-7
	7-17	Silty clay loam, gravelly silty clay loam	CL, GC, SC, ML	A-4, A-6	---	0	70-100	50-100	40-100	36-95	20-40	2-20
	17-61	Clay, silty clay loam, gravelly clay	CL, CH, GC, SC	A-7	---	0	70-100	50-100	45-100	40-90	41-70	20-42
	61-80	Clay, clay loam, gravelly clay	CH, SC, CL, GC	A-7	---	0-3	70-100	50-100	45-100	40-90	41-70	20-42
DaF:												
Dellrose--------	0-4	Gravelly silt loam	CL-ML, GC, CL, SC	A-4, A-6	0	0-10	55-90	55-85	45-75	40-70	20-35	5-15
	4-63	Gravelly silty clay loam, gravelly silt loam	GC, CL, ML, SC	A-6, A-4, A-7	0	0-15	60-90	55-90	50-75	40-70	30-45	8-18
	63-80	Clay	CH, MH	A-7	0	0	80-100	80-100	75-90	70-85	50-70	20-35
Mimosa----------	0-5	Silty clay loam	CL, ML	A-4, A-7, A-6	0	0	80-100	75-100	65-95	60-90	25-45	7-20
	5-9	Silty clay loam, silty clay, clay	CH, CL, ML, MH	A-7	0	0	95-100	90-100	85-95	80-90	45-60	18-28
	9-42	Clay, silty clay	CH, MH	A-7	0	0	95-100	90-100	85-95	80-95	51-65	25-35
	42-46	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
DeC:												
Dellrose	0-4	Gravelly silt loam	CL, SC, CL-ML, GC	A-4, A-6	0	0-10	55-90	55-85	45-75	40-70	20-35	5-15
	4-63	Gravelly silty clay loam, gravelly silt loam	GC, ML, CL, SC	A-4, A-6, A-7	0	0-15	60-90	55-90	50-75	40-70	30-45	8-18
	63-80	Clay	CH, MH	A-7	0	0	80-100	80-100	75-90	70-85	50-70	20-35
DeD2:												
Dellrose	0-4	Gravelly silt loam	CL-ML, CL, GC, SC	A-4, A-6	0	0-10	55-90	55-85	45-75	40-70	20-35	5-15
	4-63	Gravelly silty clay loam, gravelly silt loam	CL, GC, SC, ML	A-4, A-7, A-6	0	0-15	60-90	55-90	50-75	40-70	30-45	8-18
	63-80	Clay	CH, MH	A-7	0	0	80-100	80-100	75-90	70-85	50-70	20-35
DeE:												
Dellrose	0-4	Gravelly silt loam	CL-ML, CL, GC, SC	A-4, A-6	0	0-10	55-90	55-85	45-75	40-70	20-35	5-15
	4-63	Gravelly silty clay loam, gravelly silt loam	GC, CL, ML, SC	A-4, A-6, A-7	0	0-15	60-90	55-90	50-75	40-70	30-45	8-18
	63-80	Clay	CH, MH	A-7	0	0	80-100	80-100	75-90	70-85	50-70	20-35
DkB2:												
Dickson	0-11	Silt loam	CL-ML, ML	A-4	0	0	100	95-100	90-100	75-95	20-28	2-7
	11-25	Silty clay loam, silt loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	95-100	85-95	25-38	5-17
	25-51	Silty clay loam, silt loam	CL, CL-ML	A-4, A-7, A-6	0	0	95-100	90-100	85-100	80-95	25-42	7-20
	51-66	Clay, gravelly silty clay loam, gravelly clay	GC, MH, CL, ML	A-6, A-7	0	0-20	70-100	60-100	55-100	45-95	35-65	12-30

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
DkC2:												
Dickson---------	0-11	Silt loam	CL-ML, ML	A-4	0	0	100	95-100	90-100	75-95	20-28	2-7
	11-25	Silty clay loam, silt loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	95-100	85-95	25-38	5-17
	25-51	Silty clay loam, silt loam	CL, CL-ML	A-6, A-4, A-7	0	0	95-100	90-100	85-100	80-95	25-42	7-20
	51-66	Clay, gravelly silty clay loam, gravelly clay	GC, CL, MH, ML	A-6, A-7	0	0-20	70-100	60-100	55-100	45-95	35-65	12-30
HaD:												
Hawthorne-------	0-4	Gravelly silt loam	CL-ML, ML, GC-GM, GM	A-4	0	0-10	60-80	55-75	50-70	40-65	18-30	3-9
	4-23	Very channery silt loam, very channery silty clay loam	CL-ML, GC-GM, ML, GM	A-4, A-2, A-6	0-5	0-15	55-75	45-70	40-65	30-60	20-35	3-12
	23-60	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
HaF:												
Hawthorne-------	0-4	Gravelly silt loam	CL-ML, GC-GM, ML, GM	A-4	0	0-10	60-80	55-75	50-70	40-65	18-30	3-9
	4-23	Very channery silt loam, very channery silty clay loam	GC-GM, CL-ML, GM, ML	A-2, A-4, A-6	0-5	0-15	55-75	45-70	40-65	30-60	20-35	3-12
	23-60	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
HdF:												
Hawthorne-------	0-4	Gravelly silt loam	GC-GM, CL-ML, GM, ML	A-4	0	0-10	60-80	55-75	50-70	40-65	18-30	3-9
	4-23	Very channery silt loam, very channery silty clay loam	CL-ML, ML, GC-GM, GM	A-4, A-2, A-6	0-5	0-15	55-75	45-70	40-65	30-60	20-35	3-12
	23-60	Weathered bedrock	---	---	---	---	---	---	---	---	---	---

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
HdF:												
Rock outcrop.												
HoB:												
Holston---------	0-9	Loam	ML, CL-ML, SC-SM, SM	A-2, A-4	0	0	80-100	75-100	65-100	30-75	15-22	NP-6
	9-17	Clay loam, loam, sandy clay loam	ML, CL-ML, SC-SM, SM	A-2, A-4	0	0	80-100	75-100	50-100	30-80	21-33	3-10
	17-80	Clay loam, loam, sandy clay loam	CL, SC, GC, ML	A-4, A-2, A-6, A-7	0	0	60-100	55-100	50-100	30-80	30-50	7-22
HoC2:												
Holston---------	0-9	Loam	CL-ML, ML, SM, SC-SM	A-2, A-4	0	0	80-100	75-100	65-100	30-75	15-22	NP-6
	9-17	Clay loam, loam, sandy clay loam	ML, CL-ML, SC-SM, SM	A-2, A-4	0	0	80-100	75-100	50-100	30-80	21-33	3-10
	17-80	Clay loam, loam, sandy clay loam	CL, SC, GC, ML	A-4, A-6, A-2, A-7	0	0	60-100	55-100	50-100	30-80	30-50	7-22
HoD2:												
Holston---------	0-9	Loam	ML, CL-ML, SC-SM, SM	A-2, A-4	0	0	80-100	75-100	65-100	30-75	15-22	NP-6
	9-17	Clay loam, loam, sandy clay loam	ML, CL-ML, SC-SM, SM	A-2, A-4	0	0	80-100	75-100	50-100	30-80	21-33	3-10
	17-80	Clay loam, loam, sandy clay loam	CL, SC, GC, ML	A-4, A-6, A-2, A-7	0	0	60-100	55-100	50-100	30-80	30-50	7-22
HoD3:												
Holston---------	0-4	Loam	ML, CL-ML, SC-SM, SM	A-2, A-4	0	0	80-100	75-100	65-100	30-75	15-22	NP-6
	4-80	Clay loam, loam	GC, CL, ML, SC	A-2, A-7, A-4, A-6	0	0	60-100	55-100	50-100	30-80	30-50	7-22

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
HuB:												
Humphreys-------	0-5	Gravelly silt loam, gravelly loam	CL, ML, CL-ML, GC-GM	A-4	0	0-5	60-75	55-75	50-70	35-55	18-28	3-10
	5-55	Gravelly silty clay loam, gravelly clay loam, gravelly loam	CL, GC, SC	A-6	0	0-5	55-75	50-75	45-70	40-60	28-40	10-16
	55-80	Very gravelly silty clay loam, gravelly silty clay loam, gravelly clay loam	CL, SC, GC	A-4, A-2, A-6	0	0-10	45-75	40-75	30-65	20-55	25-35	8-15
HuC:												
Humphreys-------	0-5	Gravelly silt loam, gravelly loam	CL, ML, CL-ML, GC-GM	A-4	0	0-5	60-75	55-75	50-70	35-55	18-28	3-10
	5-55	Gravelly silty clay loam, gravelly clay loam, gravelly loam	CL, GC, SC	A-6	0	0-5	55-75	50-75	45-70	40-60	28-40	10-16
	55-80	Very gravelly silty clay loam, gravelly silty clay loam, gravelly clay loam	CL, SC, GC	A-4, A-2, A-6	0	0-10	45-75	40-75	30-65	20-55	25-35	8-15
Ld:												
Lindside--------	0-12	Silt loam, silty clay loam, loam	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	80-100	55-90	20-35	2-15
	12-65	Silty clay loam, silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	90-100	70-95	25-40	4-18

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
MmB2:												
Mimosa----------	0-5	Silty clay loam	CL, ML	A-7, A-4, A-6	0	0	80-100	75-100	65-95	60-90	25-45	7-20
	5-9	Silty clay loam, silty clay, clay	CL, CH, MH, ML	A-7	0	0	95-100	90-100	85-95	80-90	45-60	18-28
	9-42	Clay, silty clay	CH, MH	A-7	0	0	95-100	90-100	85-95	80-95	51-65	25-35
	42-46	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
MmC2:												
Mimosa----------	0-5	Silty clay loam	CL, ML	A-6, A-4, A-7	0	0	80-100	75-100	65-95	60-90	25-45	7-20
	5-9	Silty clay loam, silty clay, clay	CL, CH, MH, ML	A-7	0	0	95-100	90-100	85-95	80-90	45-60	18-28
	9-42	Clay, silty clay	CH, MH	A-7	0	0	95-100	90-100	85-95	80-95	51-65	25-35
	42-46	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
MmD2:												
Mimosa----------	0-5	Silty clay loam	CL, ML	A-4, A-6, A-7	0	0	80-100	75-100	65-95	60-90	25-45	7-20
	5-9	Silty clay loam, silty clay, clay	CH, ML, CL, MH	A-7	0	0	95-100	90-100	85-95	80-90	45-60	18-28
	9-42	Clay, silty clay	CH, MH	A-7	0	0	95-100	90-100	85-95	80-95	51-65	25-35
	42-46	Unweathered bedrock	---	---	---	---	---	---	---	---	---	---
Mn:												
Minter----------	0-7	Silt loam	CL, ML, CL-ML	A-4, A-6	0	0	100	100	80-100	65-95	26-40	5-18
	7-68	Silty clay, clay, silty clay loam	CH, CL	A-6, A-7	0	0	100	100	90-100	75-95	37-59	18-32
MtB2:												
Mountview-------	0-8	Silt loam	CL-ML, ML	A-4	0	0	100	95-100	95-100	80-96	20-30	2-7
	8-39	Silty clay loam, silt loam	CL	A-6, A-7	0	0	95-100	95-100	90-100	80-96	30-43	10-23
	39-80	Silty clay, gravelly clay, gravelly silty clay loam	CL, MH, CH, ML	A-6, A-7	---	0-20	75-100	65-100	60-98	50-96	35-65	11-32

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
MtC2:												
Mountview-------	0-8	Silt loam	CL-ML, ML	A-4	0	0	100	95-100	95-100	80-96	20-30	2-7
	8-39	Silty clay loam, silt loam	CL	A-6, A-7	0	0	95-100	95-100	90-100	80-96	30-43	10-23
	39-80	Silty clay, gravelly clay, gravelly silty clay loam	CL, CH, MH, ML	A-6, A-7	---	0-20	75-100	65-100	60-98	50-96	35-65	11-32
Oc:												
Ocana-----------	0-7	Gravelly silt loam	CL-ML, GM, CL, SM	A-4, A-6	0	0-8	65-80	60-75	50-70	36-65	20-35	3-12
	7-65	Stratified gravelly silt loam, stratified gravelly loam, stratified gravelly clay loam	GC, CL, GC-GM, GM	A-2, A-4, A-6	0	0-8	60-80	55-75	45-65	30-55	20-40	3-18
Sk:												
Skidmore--------	0-10	Gravelly loam	GM, ML, SM	A-4	0	0	75-90	70-85	70-85	55-75	20-35	2-10
	10-65	Stratified very gravelly coarse sandy loam, stratified very gravelly clay loam, stratified extremely gravelly clay loam	GM, GP-GM	A-1, A-2	---	5-30	35-60	20-50	15-40	10-35	15-30	NP-5
St:												
Staser----------	0-32	Loam	CL, CL-ML, ML	A-4, A-6	0	0	90-100	80-100	60-85	55-80	20-35	3-15
	32-80	Loam, fine sandy loam	CL-ML, CL, SC, SC-SM	A-2, A-4, A-6	---	0	45-100	40-100	35-80	30-75	20-35	5-15

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
SuC2:												
Sugargrove------	0-12	Gravelly silt loam	CL-ML, CL, GM, ML	A-4	0	0-10	65-85	55-80	45-75	40-75	25-35	4-10
	12-51	Gravelly silty clay loam, gravelly silt loam, channery silty clay loam	CL, CL-ML, GC-GM	A-4, A-6	0	0-15	65-85	55-80	45-75	40-70	25-40	6-20
	51-65	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
SuD2:												
Sugargrove------	0-12	Gravelly silt loam	CL-ML, CL, GM, ML	A-4	0	0-10	65-85	55-80	45-75	40-75	25-35	4-10
	12-51	Gravelly silty clay loam, gravelly silt loam, channery silty clay loam	CL, CL-ML, GC-GM	A-4, A-6	0	0-15	65-85	55-80	45-75	40-70	25-40	6-20
	51-65	Weathered bedrock	---	---	---	---	---	---	---	---	---	---
SwB:												
Swafford--------	0-9	Loam	CL, CL-ML, ML	A-4	0	0	90-100	85-100	75-100	55-85	20-35	2-10
	9-35	Clay loam, loam	CL, CL-ML, ML	A-4, A-6	0	0	90-100	85-100	75-95	51-80	25-40	6-16
	35-55	Clay loam, loam	CL, CL-ML, ML	A-4, A-6	0	0	90-100	85-100	75-95	51-80	25-40	6-16
	55-70	Clay loam, loam	CL, CL-ML, ML	A-4, A-6	0	0	90-100	85-100	75-95	51-80	25-40	6-16
SwC:												
Swafford--------	0-9	Loam	CL, CL-ML, ML	A-4	0	0	90-100	85-100	75-100	55-85	20-35	2-10
	9-35	Clay loam, loam	CL, CL-ML, ML	A-4, A-6	0	0	90-100	85-100	75-95	51-80	25-40	6-16
	35-55	Clay loam, loam	CL, CL-ML, ML	A-4, A-6	0	0	90-100	85-100	75-95	51-80	25-40	6-16
	55-70	Clay loam, loam	CL, ML, CL-ML	A-4, A-6	0	0	90-100	85-100	75-95	51-80	25-40	6-16
SyB2:												
Sykes-----------	0-5	Silt loam	CL, ML, CL-ML	A-4, A-6	0	0	85-100	85-100	75-100	65-90	25-35	5-12
	5-24	Silty clay loam, silt loam	CL	A-4, A-6, A-7	0	0	85-100	85-100	80-100	70-95	30-42	8-18
	24-50	Silty clay, clay	CL, CH, MH	A-7	0	0	85-100	85-100	80-100	70-95	41-65	18-35
	50-80	Clay, silty clay	CH, CL, MH	A-7	0	0-5	85-100	85-100	80-100	70-95	45-70	20-38

Table 15.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
SyC2:												
Sykes	0-5	Silt loam	CL-ML, CL, ML	A-4, A-6	0	0	85-100	85-100	75-100	65-90	25-35	5-12
	5-24	Silty clay loam, silt loam	CL	A-4, A-6, A-7	0	0	85-100	85-100	80-100	70-95	30-42	8-18
	24-50	Silty clay, clay	CH, CL, MH	A-7	0	0	85-100	85-100	80-100	70-95	41-65	18-35
	50-80	Clay, silty clay	CH, CL, MH	A-7	0	0-5	85-100	85-100	80-100	70-95	45-70	20-38
Ud:												
Udarents.												

Table 16.--Physical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (K_{sat})	Available water capacity	Linear extensibility	Organic matter	Erosion factors		
								Kw	Kf	T
	In	Pct	g/cc	In/hr	In/in	Pct	Pct			
AmB:										
Armour	0-13	15-27	1.30-1.45	0.60-2.00	0.18-0.23	0.0-2.9	1.0-3.0	.43	.43	5
	13-80	22-40	1.30-1.50	0.60-2.00	0.17-0.20	0.0-2.9	0.0-0.5	.37	.37	
AmC2:										
Armour	0-9	15-27	1.30-1.45	0.60-2.00	0.18-0.23	0.0-2.9	1.0-3.0	.43	.43	5
	9-80	22-40	1.30-1.50	0.60-2.00	0.17-0.20	0.0-2.9	0.0-0.5	.37	.37	
AmD2:										
Armour	0-9	15-27	1.30-1.45	0.60-2.00	0.18-0.23	0.0-2.9	1.0-3.0	.43	.43	5
	9-80	22-40	1.30-1.50	0.60-2.00	0.17-0.20	0.0-2.9	0.0-0.5	.37	.37	
Ar:										
Arrington	0-37	18-35	1.30-1.45	0.60-2.00	0.19-0.22	0.0-2.9	2.0-4.0	.37	.37	5
	37-55	18-35	1.30-1.45	0.60-2.00	0.19-0.22	0.0-2.9	0.5-2.0	.37	.37	
	55-80	20-45	1.30-1.45	0.60-2.00	0.17-0.22	0.0-2.9	0.5-2.0	.32	.32	
BaF:										
Barfield	0-4	35-55	1.30-1.50	0.20-0.60	0.10-0.15	3.0-5.9	2.0-4.0	.24	.24	1
	4-18	35-55	1.30-1.50	0.20-0.60	0.09-0.14	6.0-8.9	1.0-3.0	.17	.20	
	18-22	---	---	---	---	---	---	---	---	
Gladdice	0-6	22-40	1.20-1.40	0.60-2.00	0.14-0.18	3.0-5.9	2.0-5.0	.28	.32	2
	6-13	35-55	1.30-1.45	0.20-0.60	0.12-0.15	6.0-8.9	0.5-1.0	.24	.24	
	13-30	40-60	1.30-1.45	0.20-0.60	0.12-0.15	6.0-8.9	0.5-1.0	.24	.24	
	30-34	---	---	---	---	---	---	---	---	
Rock outcrop.										
BcD:										
Barfield	0-4	35-55	1.30-1.50	0.20-0.60	0.10-0.15	3.0-5.9	2.0-4.0	.24	.24	1
	4-18	35-55	1.30-1.50	0.20-0.60	0.09-0.14	6.0-8.9	1.0-3.0	.17	.20	
	18-22	---	---	---	---	---	---	---	---	
Rock outcrop.										
BeB2:										
Bewleyville	0-6	15-27	1.30-1.50	0.60-2.00	0.20-0.22	0.0-2.9	1.0-3.0	.43	.43	5
	6-26	22-35	1.35-1.55	0.60-2.00	0.18-0.20	0.0-2.9	0.0-0.5	.37	.37	
	26-80	35-50	1.30-1.50	0.60-2.00	0.12-0.17	3.0-5.9	0.0-0.5	.37	.32	
BeC2:										
Bewleyville	0-6	15-27	1.30-1.50	0.60-2.00	0.20-0.22	0.0-2.9	1.0-3.0	.43	.43	5
	6-26	22-35	1.35-1.55	0.60-2.00	0.18-0.20	0.0-2.9	0.0-0.5	.37	.37	
	26-80	35-50	1.30-1.50	0.60-2.00	0.12-0.17	3.0-5.9	0.0-0.5	.37	.32	
CrB2:										
Christian	0-7	12-27	1.20-1.40	0.60-2.00	0.18-0.20	0.0-2.9	1.0-3.0	.37	.37	4
	7-17	27-40	1.20-1.50	0.60-2.00	0.14-0.19	3.0-5.9	---	.28	.32	
	17-61	40-60	1.30-1.60	0.06-0.20	0.10-0.16	3.0-5.9	---	.28	.28	
	61-80	40-60	1.30-1.60	0.06-0.20	0.10-0.16	3.0-5.9	---	.28	.28	
CrC2:										
Christian	0-7	12-27	1.20-1.40	0.60-2.00	0.18-0.20	0.0-2.9	1.0-3.0	.37	.37	4
	7-17	27-40	1.20-1.50	0.60-2.00	0.14-0.19	3.0-5.9	---	.28	.32	
	17-61	40-60	1.30-1.60	0.06-0.20	0.10-0.16	3.0-5.9	---	.28	.28	
	61-80	40-60	1.30-1.60	0.06-0.20	0.10-0.16	3.0-5.9	---	.28	.28	

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (K_{sat})	Available water capacity	Linear extensibility	Organic matter	Erosion factors		
								Kw	Kf	T
	In	Pct	g/cc	In/hr	In/in	Pct	Pct			
CrD2:										
Christian	0-7	12-27	1.20-1.40	0.60-2.00	0.18-0.20	0.0-2.9	1.0-3.0	.37	.37	4
	7-17	27-40	1.20-1.50	0.60-2.00	0.14-0.19	3.0-5.9	---	.28	.32	
	17-61	40-60	1.30-1.60	0.06-0.20	0.10-0.16	3.0-5.9	---	.28	.28	
	61-80	40-60	1.30-1.60	0.06-0.20	0.10-0.16	3.0-5.9	---	.28	.28	
DaF:										
Dellrose	0-4	15-27	1.20-1.40	2.00-6.00	0.10-0.17	0.0-2.9	1.0-3.0	.24	.32	5
	4-63	20-35	1.20-1.40	2.00-6.00	0.09-0.16	0.0-2.9	0.0-0.5	.24	.28	
	63-80	40-55	1.30-1.50	0.60-2.00	0.08-0.12	3.0-5.9	0.0-0.5	.24	.24	
Mimosa	0-5	24-40	1.30-1.50	0.60-2.00	0.12-0.20	0.0-2.9	1.0-3.0	.37	.37	3
	5-9	35-55	1.30-1.50	0.20-0.60	0.12-0.16	3.0-5.9	0.0-0.5	.28	.28	
	9-42	45-60	1.35-1.55	0.02-0.20	0.10-0.16	3.0-5.9	0.0-0.5	.24	.24	
	42-46	---	---	---	---	---	---	---	---	
DeC:										
Dellrose	0-4	15-27	1.20-1.40	2.00-6.00	0.10-0.17	0.0-2.9	1.0-3.0	.24	.32	5
	4-63	20-35	1.20-1.40	2.00-6.00	0.09-0.16	0.0-2.9	0.0-0.5	.24	.28	
	63-80	40-55	1.30-1.50	0.60-2.00	0.08-0.12	3.0-5.9	0.0-0.5	.24	.24	
DeD2:										
Dellrose	0-4	15-27	1.20-1.40	2.00-6.00	0.10-0.17	0.0-2.9	1.0-3.0	.24	.32	5
	4-63	20-35	1.20-1.40	2.00-6.00	0.09-0.16	0.0-2.9	0.0-0.5	.24	.28	
	63-80	40-55	1.30-1.50	0.60-2.00	0.08-0.12	3.0-5.9	0.0-0.5	.24	.24	
DeE:										
Dellrose	0-4	15-27	1.20-1.40	2.00-6.00	0.10-0.17	0.0-2.9	1.0-3.0	.24	.32	5
	4-63	20-35	1.20-1.40	2.00-6.00	0.09-0.16	0.0-2.9	0.0-0.5	.24	.28	
	63-80	40-55	1.30-1.50	0.60-2.00	0.08-0.12	3.0-5.9	0.0-0.5	.24	.24	
DkB2:										
Dickson	0-11	15-26	1.30-1.50	0.60-2.00	0.18-0.22	0.0-2.9	0.5-2.0	.43	.43	4
	11-25	18-30	1.35-1.55	0.60-2.00	0.18-0.20	0.0-2.9	0.0-0.5	.43	.43	
	25-51	20-32	1.55-1.75	0.02-0.20	0.01-0.01	0.0-2.9	0.0-0.5	.43	.43	
	51-66	35-50	1.35-1.55	0.20-0.60	0.02-0.04	3.0-5.9	0.0-0.5	.28	.32	
DkC2:										
Dickson	0-11	15-26	1.30-1.50	0.60-2.00	0.18-0.22	0.0-2.9	0.5-2.0	.43	.43	4
	11-25	18-30	1.35-1.55	0.60-2.00	0.18-0.20	0.0-2.9	0.0-0.5	.43	.43	
	25-51	20-32	1.55-1.75	0.02-0.20	0.01-0.01	0.0-2.9	0.0-0.5	.43	.43	
	51-66	35-50	1.35-1.55	0.20-0.60	0.02-0.04	3.0-5.9	0.0-0.5	.28	.32	
HaD:										
Hawthorne	0-4	12-25	1.40-1.50	2.00-6.00	0.14-0.18	0.0-2.9	1.0-3.0	.20	.37	3
	4-23	15-32	1.40-1.50	2.00-6.00	0.05-0.10	0.0-2.9	0.0-0.5	.10	.32	
	23-60	---	---	---	---	---	---	---	---	
HaF:										
Hawthorne	0-4	12-25	1.40-1.50	2.00-6.00	0.14-0.18	0.0-2.9	1.0-3.0	.20	.37	3
	4-23	15-32	1.40-1.50	2.00-6.00	0.05-0.10	0.0-2.9	0.0-0.5	.10	.32	
	23-60	---	---	---	---	---	---	---	---	
HdF:										
Hawthorne	0-4	12-25	1.40-1.50	2.00-6.00	0.14-0.18	0.0-2.9	1.0-3.0	.20	.37	3
	4-23	15-32	1.40-1.50	2.00-6.00	0.05-0.10	0.0-2.9	0.0-0.5	.10	.32	
	23-60	---	---	---	---	---	---	---	---	
Rock outcrop.										

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (K_{sat})	Available water capacity	Linear extensibility	Organic matter	Erosion factors		
								Kw	Kf	T
	In	Pct	g/cc	In/hr	In/in	Pct	Pct			
HoB:										
Holston	0-9	10-25	1.35-1.50	0.60-2.00	0.15-0.20	0.0-2.9	0.5-2.0	.28	.28	5
	9-17	18-35	1.40-1.55	0.60-2.00	0.13-0.20	0.0-2.9	0.0-0.5	.32	.32	
	17-80	20-45	1.40-1.60	0.60-2.00	0.10-0.18	0.0-2.9	0.0-0.5	.32	.32	
HoC2:										
Holston	0-9	10-25	1.35-1.50	0.60-2.00	0.15-0.20	0.0-2.9	0.5-2.0	.28	.28	5
	9-17	18-35	1.40-1.55	0.60-2.00	0.13-0.20	0.0-2.9	0.0-0.5	.32	.32	
	17-80	20-45	1.40-1.60	0.60-2.00	0.10-0.18	0.0-2.9	0.0-0.5	.32	.32	
HoD2:										
Holston	0-9	10-25	1.35-1.50	0.60-2.00	0.15-0.20	0.0-2.9	0.5-2.0	.28	.28	5
	9-17	18-35	1.40-1.55	0.60-2.00	0.13-0.20	0.0-2.9	0.0-0.5	.32	.32	
	17-80	20-45	1.40-1.60	0.60-2.00	0.10-0.18	0.0-2.9	0.0-0.5	.32	.32	
HoD3:										
Holston	0-4	10-25	1.35-1.50	0.60-2.00	0.15-0.20	0.0-2.9	0.5-2.0	.28	.28	5
	4-80	20-45	1.40-1.60	0.60-2.00	0.10-0.18	0.0-2.9	0.0-0.5	.32	.32	
HuB:										
Humphreys	0-5	12-25	1.35-1.50	2.00-6.00	0.10-0.15	0.0-2.9	2.0-4.0	.28	.32	5
	5-55	18-32	1.35-1.55	2.00-6.00	0.09-0.14	0.0-2.9	0.0-0.5	.24	.28	
	55-80	18-32	1.40-1.60	2.00-10.00	0.06-0.12	0.0-2.9	0.0-0.5	.24	.28	
HuC:										
Humphreys	0-5	12-25	1.35-1.50	2.00-6.00	0.10-0.15	0.0-2.9	2.0-4.0	.28	.32	5
	5-55	18-32	1.35-1.55	2.00-6.00	0.09-0.14	0.0-2.9	0.0-0.5	.24	.28	
	55-80	18-32	1.40-1.60	2.00-10.00	0.06-0.12	0.0-2.9	0.0-0.5	.24	.28	
Ld:										
Lindside	0-12	15-27	1.20-1.40	0.60-2.00	0.20-0.26	0.0-2.9	2.0-4.0	.32	.32	5
	12-65	18-35	1.20-1.40	0.20-2.00	0.17-0.22	0.0-2.9	0.0-0.5	.37	.37	
MmB2:										
Mimosa	0-5	24-40	1.30-1.50	0.60-2.00	0.12-0.20	0.0-2.9	1.0-3.0	.37	.37	3
	5-9	35-55	1.30-1.50	0.20-0.60	0.12-0.16	3.0-5.9	0.0-0.5	.28	.28	
	9-42	45-60	1.35-1.55	0.02-0.20	0.10-0.16	3.0-5.9	0.0-0.5	.24	.24	
	42-46	---	---	---	---	---	---	---	---	
MmC2:										
Mimosa	0-5	24-40	1.30-1.50	0.60-2.00	0.12-0.20	0.0-2.9	1.0-3.0	.37	.37	3
	5-9	35-55	1.30-1.50	0.20-0.60	0.12-0.16	3.0-5.9	0.0-0.5	.28	.28	
	9-42	45-60	1.35-1.55	0.02-0.20	0.10-0.16	3.0-5.9	0.0-0.5	.24	.24	
	42-46	---	---	---	---	---	---	---	---	
MmD2:										
Mimosa	0-5	24-40	1.30-1.50	0.60-2.00	0.12-0.20	0.0-2.9	1.0-3.0	.37	.37	3
	5-9	35-55	1.30-1.50	0.20-0.60	0.12-0.16	3.0-5.9	0.0-0.5	.28	.28	
	9-42	45-60	1.35-1.55	0.02-0.20	0.10-0.16	3.0-5.9	0.0-0.5	.24	.24	
	42-46	---	---	---	---	---	---	---	---	
Mn:										
Minter	0-7	14-27	1.45-1.65	0.57-1.98	0.16-0.22	0.0-2.9	1.0-3.0	.37	.37	5
	7-68	35-50	1.35-1.65	0.02-0.06	0.14-0.20	3.0-5.9	0.1-0.5	.32	.32	
MtB2:										
Mountview	0-8	15-25	1.35-1.55	0.60-2.00	0.18-0.22	0.0-2.9	1.0-3.0	.43	.43	5
	8-39	20-35	1.40-1.60	0.60-2.00	0.17-0.20	0.0-2.9	0.0-0.5	.43	.43	
	39-80	35-55	1.30-1.50	0.60-2.00	0.10-0.15	3.0-5.9	0.0-0.5	.32	.37	

Table 16.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (K_{sat})	Available water capacity	Linear extensibility	Organic matter	Erosion factors		
								Kw	Kf	T
	In	Pct	g/cc	In/hr	In/in	Pct	Pct			
MtC2:										
Mountview	0-8	15-25	1.35-1.55	0.60-2.00	0.18-0.22	0.0-2.9	1.0-3.0	.43	.43	5
	8-39	20-35	1.40-1.60	0.60-2.00	0.17-0.20	0.0-2.9	0.0-0.5	.43	.43	
	39-80	35-55	1.30-1.50	0.20-2.00	0.10-0.15	3.0-5.9	0.0-0.5	.32	.37	
Oc:										
Ocana	0-7	18-27	1.35-1.50	2.00-6.00	0.12-0.18	0.0-2.9	1.0-3.0	.28	.32	5
	7-65	20-32	1.35-1.50	2.00-6.00	0.10-0.17	0.0-2.9	0.5-1.0	.28	.32	
Sk:										
Skidmore	0-10	17-27	1.20-1.40	2.00-6.00	0.13-0.18	0.0-2.9	1.0-3.0	.32	.32	3
	10-65	7-18	1.30-1.60	2.00-10.00	0.04-0.10	0.0-2.9	---	.17	.24	
St:										
Staser	0-32	18-27	1.40-1.60	0.60-2.00	0.15-0.22	0.0-2.9	2.0-4.0	.32	.32	5
	32-80	18-27	1.40-1.60	0.60-2.00	0.07-0.18	0.0-2.9	---	.28	.32	
SuC2:										
Sugargrove	0-12	10-27	1.20-1.40	0.60-6.00	0.14-0.19	0.0-2.9	1.0-3.0	.28	.37	4
	12-51	18-35	1.30-1.50	0.60-6.00	0.14-0.19	0.0-2.9	0.0-0.5	.28	.32	
	51-65	---	---	---	---	---	---	---	---	
SuD2:										
Sugargrove	0-12	10-27	1.20-1.40	0.60-6.00	0.14-0.19	0.0-2.9	1.0-3.0	.28	.37	4
	12-51	18-35	1.30-1.50	0.60-6.00	0.14-0.19	0.0-2.9	0.0-0.5	.28	.32	
	51-65	---	---	---	---	---	---	---	---	
SwB:										
Swafford	0-9	12-25	1.35-1.50	0.60-2.00	0.16-0.20	0.0-2.9	1.0-2.0	.37	.37	5
	9-35	18-32	1.40-1.50	0.60-2.00	0.14-0.20	0.0-2.9	0.5-1.0	.32	.32	
	35-55	18-32	1.45-1.60	0.20-0.60	0.13-0.17	0.0-2.9	0.0-0.5	.32	.32	
	55-70	18-32	1.40-1.55	0.20-0.60	0.13-0.17	0.0-2.9	0.0-0.5	.32	.32	
SwC:										
Swafford	0-9	12-25	1.35-1.50	0.60-2.00	0.16-0.20	0.0-2.9	1.0-2.0	.37	.37	5
	9-35	18-32	1.40-1.50	0.60-2.00	0.14-0.20	0.0-2.9	0.5-1.0	.32	.32	
	35-55	18-32	1.45-1.60	0.20-0.60	0.13-0.17	0.0-2.9	0.0-0.5	.32	.32	
	55-70	18-32	1.40-1.55	0.20-0.60	0.13-0.17	0.0-2.9	0.0-0.5	.32	.32	
SyB2:										
Sykes	0-5	15-27	1.35-1.55	0.60-2.00	0.19-0.23	0.0-2.9	1.0-3.0	.43	.43	5
	5-24	24-35	1.35-1.55	0.60-2.00	0.18-0.22	0.0-2.9	0.0-0.5	.37	.37	
	24-50	35-60	1.30-1.50	0.02-0.20	0.13-0.17	3.0-5.9	0.0-0.5	.32	.32	
	50-80	45-60	1.30-1.50	0.02-0.20	0.12-0.16	3.0-5.9	0.0-0.5	.32	.32	
SyC2:										
Sykes	0-5	15-27	1.35-1.55	0.60-2.00	0.19-0.23	0.0-2.9	1.0-3.0	.43	.43	5
	5-24	24-35	1.35-1.55	0.60-2.00	0.18-0.22	0.0-2.9	0.0-0.5	.37	.37	
	24-50	35-60	1.30-1.50	0.02-0.20	0.13-0.17	3.0-5.9	0.0-0.5	.32	.32	
	50-80	45-60	1.30-1.50	0.02-0.20	0.12-0.16	3.0-5.9	0.0-0.5	.32	.32	
Ud:										
Udarents.										

Table 17.--Chemical Properties of the Soils

(Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	In	meq/100 g	meq/100 g	pH
AmB:				
Armour	0-13	5-15	---	5.1-6.0
	13-80	5-15	---	5.1-6.0
AmC2:				
Armour	0-9	5-15	---	5.1-6.0
	9-80	5-15	---	5.1-6.0
AmD2:				
Armour	0-9	5-15	---	5.1-6.0
	9-80	5-15	---	5.1-6.0
Ar:				
Arrington	0-37	5-15	---	6.1-7.8
	37-55	5-15	---	6.1-7.8
	55-80	5-15	---	6.1-7.8
BaF:				
Barfield	0-4	20-50	---	6.1-7.8
	4-18	20-40	---	6.1-7.8
	18-22	---	---	---
Gladdice	0-6	20-50	---	5.6-7.8
	6-13	20-40	---	5.6-7.8
	13-30	20-40	---	5.6-7.8
	30-34	---	---	---
Rock outcrop.				
BcD:				
Barfield	0-4	20-50	---	6.1-7.8
	4-18	20-40	---	6.1-7.8
	18-22	---	---	---
Rock outcrop.				
BeB2:				
Bewleyville	0-6	5-15	---	4.5-6.5
	6-26	2-10	---	4.5-6.0
	26-80	2-10	---	4.5-5.5
BeC2:				
Bewleyville	0-6	5-15	---	4.5-6.5
	6-26	2-10	---	4.5-6.0
	26-80	2-10	---	4.5-5.5
CrB2:				
Christian	0-7	5-15	---	4.5-6.5
	7-17	5-10	---	4.5-5.5
	17-61	5-10	---	4.5-5.5
	61-80	5-10	---	4.5-5.5
CrC2:				
Christian	0-7	5-15	---	4.5-6.5
	7-17	5-10	---	4.5-5.5
	17-61	5-10	---	4.5-5.5
	61-80	5-10	---	4.5-5.5

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	In	meq/100 g	meq/100 g	pH
CrD2:				
Christian	0-7	5-15	---	4.5-6.5
	7-17	5-10	---	4.5-5.5
	17-61	5-10	---	4.5-5.5
	61-80	5-10	---	4.5-5.5
DaF:				
Dellrose	0-4	5-15	---	4.5-6.0
	4-63	5-15	---	4.5-6.0
	63-80	5-15	---	4.5-6.0
Mimosa	0-5	10-15	---	4.5-6.0
	5-9	10-30	---	4.5-6.0
	9-42	10-30	---	4.5-6.0
	42-46	---	---	---
DeC:				
Dellrose	0-4	5-15	---	4.5-6.0
	4-63	5-15	---	4.5-6.0
	63-80	5-15	---	4.5-6.0
DeD2:				
Dellrose	0-4	5-15	---	4.5-6.0
	4-63	5-15	---	4.5-6.0
	63-80	5-15	---	4.5-6.0
DeE:				
Dellrose	0-4	5-15	---	4.5-6.0
	4-63	5-15	---	4.5-6.0
	63-80	5-15	---	4.5-6.0
DkB2:				
Dickson	0-11	---	2-10	4.5-5.5
	11-25	---	2-10	4.5-5.5
	25-51	---	2-10	4.5-5.5
	51-66	---	5-10	4.5-5.5
DkC2:				
Dickson	0-11	---	2-10	4.5-5.5
	11-25	---	2-10	4.5-5.5
	25-51	---	2-10	4.5-5.5
	51-66	---	5-15	4.5-5.5
HaD:				
Hawthorne	0-4	---	2-10	3.6-5.5
	4-23	---	2-5	3.6-5.5
	23-60	---	---	---
HaF:				
Hawthorne	0-4	---	2-10	3.6-5.5
	4-23	---	2-5	3.6-5.5
	23-60	---	---	---
HdF:				
Hawthorne	0-4	---	2-10	3.6-5.5
	4-23	---	2-5	3.6-5.5
	23-60	---	---	---
Rock outcrop.				

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	In	meq/100 g	meq/100 g	pH
HoB:				
Holston	0-9	---	5-15	4.5-5.5
	9-17	---	2-10	4.5-5.5
	17-80	---	2-10	4.5-5.5
HoC2:				
Holston	0-9	---	5-15	4.5-5.5
	9-17	---	2-10	4.5-5.5
	17-80	---	2-10	4.5-5.5
HoD2:				
Holston	0-9	---	5-15	4.5-5.5
	9-17	---	2-10	4.5-5.5
	17-80	---	2-10	4.5-5.5
HoD3:				
Holston	0-4	---	2-10	4.5-5.5
	4-80	---	2-10	4.5-5.5
HuB:				
Humphreys	0-5	5-15	---	4.5-6.0
	5-55	2-10	---	4.5-6.0
	55-80	2-10	---	4.5-6.0
HuC:				
Humphreys	0-5	5-15	---	4.5-6.0
	5-55	2-10	---	4.5-6.0
	55-80	2-10	---	4.5-6.0
Ld:				
Lindside	0-12	15-30	---	5.1-7.8
	12-65	15-25	---	5.1-7.8
MmB2:				
Mimosa	0-5	10-15	---	4.5-6.0
	5-9	10-30	---	4.5-6.0
	9-42	10-30	---	4.5-6.0
	42-46	---	---	---
MmC2:				
Mimosa	0-5	10-15	---	4.5-6.0
	5-9	10-30	---	4.5-6.0
	9-42	10-30	---	4.5-6.0
	42-46	---	---	---
MmD2:				
Mimosa	0-5	10-15	---	4.5-6.0
	5-9	10-30	---	4.5-6.0
	9-42	10-30	---	4.5-6.0
	42-46	---	---	---
Mn:				
Minter	0-7	---	2-10	4.5-5.5
	7-68	---	2-10	4.5-5.5
MtB2:				
Mountview	0-8	---	2-10	4.5-5.5
	8-39	---	2-10	4.5-5.5
	39-80	---	2-10	4.5-5.5

Table 17.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	In	meq/100 g	meq/100 g	pH
MtC2:				
Mountview	0-8	---	2-10	4.5-5.5
	8-39	---	2-10	4.5-5.5
	39-80	---	2-10	4.5-5.5
Oc:				
Ocana	0-7	5-15	---	5.6-7.3
	7-65	5-20	---	5.6-7.3
Sk:				
Skidmore	0-10	5-15	---	5.6-7.8
	10-65	5-20	---	5.6-7.8
St:				
Staser	0-32	5-15	---	5.6-7.3
	32-80	5-20	---	5.6-7.3
SuC2:				
Sugargrove	0-12	---	5.0-10	4.5-5.5
	12-51	---	5.0-10	4.5-5.5
	51-65	---	---	---
SuD2:				
Sugargrove	0-12	---	5.0-10	4.5-5.5
	12-51	---	5.0-10	4.5-5.5
	51-65	---	---	---
SwB:				
Swafford	0-9	5-15	---	4.5-6.0
	9-35	2-10	---	4.5-6.0
	35-55	2-10	---	4.5-6.0
	55-70	2-10	---	4.5-6.0
SwC:				
Swafford	0-9	5-15	---	4.5-6.0
	9-35	2-10	---	4.5-6.0
	35-55	2-10	---	4.5-6.0
	55-70	2-10	---	4.5-6.0
SyB2:				
Sykes	0-5	5-15	---	5.1-6.5
	5-24	5-15	---	5.1-6.0
	24-50	5-30	---	5.1-6.0
	50-80	5-30	---	5.6-7.8
SyC2:				
Sykes	0-5	5-15	---	5.1-6.5
	5-24	5-15	---	5.1-6.0
	24-50	5-30	---	5.1-6.0
	50-80	5-30	---	5.6-7.8
Ud:				
Udarents.				

Table 18.--Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Restrictive layer			Risk of corrosion	
	Kind	Depth to top	Hardness	Uncoated steel	Concrete
		In			
AmB:					
Armour	---	---	---	Moderate	Moderate
AmC2:					
Armour	---	---	---	Moderate	Moderate
AmD2:					
Armour	---	---	---	Moderate	Moderate
Ar:					
Arrington	---	---	---	Low	Low
BaF:					
Barfield	Bedrock (lithic)	8-20	Indurated	High	Low
Gladdice	Bedrock (lithic)	20-40	Indurated	High	Low
Rock outcrop.					
BcD:					
Barfield	Bedrock (lithic)	8-20	Indurated	High	Low
Rock outcrop.					
BeB2:					
Bewleyville	---	---	---	Moderate	Moderate
BeC2:					
Bewleyville	---	---	---	Moderate	Moderate
CrB2:					
Christian	---	---	---	High	High
CrC2:					
Christian	---	---	---	High	High
CrD2:					
Christian	---	---	---	High	High
DaF:					
Dellrose	---	---	---	High	Moderate
Mimosa	Bedrock (lithic)	40-60	Indurated	High	Moderate
DeC:					
Dellrose	---	---	---	High	Moderate
DeD2:					
Dellrose	---	---	---	High	Moderate
DeE:					
Dellrose	---	---	---	High	Moderate
DkB2:					
Dickson	Fragipan	20-25	Noncemented	Moderate	Moderate
DkC2:					
Dickson	Fragipan	20-25	Noncemented	Moderate	Moderate

Table 18.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Risk of corrosion	
	Kind	Depth to top	Hardness	Uncoated steel	Concrete
		In			
HaD:					
Hawthorne	Bedrock (paralithic)	20-40	Strongly cemented	Low	High
HaF:					
Hawthorne	Bedrock (paralithic)	20-40	Strongly cemented	Low	High
HdF:					
Hawthorne	Bedrock (paralithic)	20-40	Strongly cemented	Low	High
Rock outcrop.					
HoB:					
Holston	---	---	---	Moderate	High
HoC2:					
Holston	---	---	---	Moderate	High
HoD2:					
Holston	---	---	---	Moderate	High
HoD3:					
Holston	---	---	---	Moderate	High
HuB:					
Humphreys	---	---	---	Moderate	Moderate
HuC:					
Humphreys	---	---	---	Moderate	Moderate
Ld:					
Lindside	---	---	---	Moderate	Low
MmB2:					
Mimosa	Bedrock (lithic)	40-60	Indurated	High	Moderate
MmC2:					
Mimosa	Bedrock (lithic)	40-60	Indurated	High	Moderate
MmD2:					
Mimosa	Bedrock (lithic)	40-60	Indurated	High	Moderate
Mn:					
Minter	---	---	---	High	High
MtB2:					
Mountview	---	---	---	Moderate	Moderate
MtC2:					
Mountview	---	---	---	Moderate	Moderate
Oc:					
Ocana	---	---	---	Low	Low
Sk:					
Skidmore	---	---	---	Low	Moderate
St:					
Staser	---	---	---	Low	Low

Table 18.--Soil Features--Continued

Map symbol and soil name	Restrictive layer			Risk of corrosion	
	Kind	Depth to top	Hardness	Uncoated steel	Concrete
		In			
SuC2:					
Sugargrove	Bedrock (paralithic)	20-60	Strongly cemented	Moderate	Moderate
SuD2:					
Sugargrove	Bedrock (paralithic)	20-60	Strongly cemented	Moderate	Moderate
SwB:					
Swafford	Fragic layer	25-36	Noncemented	Moderate	Moderate
SwC:					
Swafford	Fragic layer	25-36	Noncemented	Moderate	Moderate
SyB2:					
Sykes	---	---	---	High	Moderate
SyC2:					
Sykes	---	---	---	High	Moderate
Ud:					
Udarents.					

Table 19.--Water Features

(See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydrologic group	Month	Water table		Flooding	
			Upper limit	Lower limit	Duration	Frequency
			Ft	Ft		
AmB:						
Armour	B	Jan-Dec	---	---	---	None
AmC2:						
Armour	B	Jan-Dec	---	---	---	None
AmD2:						
Armour	B	Jan-Dec	---	---	---	None
Ar:						
Arrington	B	January	4.0-6.0	>6.0	Very brief	Occasional
		February	4.0-6.0	>6.0	Very brief	Occasional
		March	4.0-6.0	>6.0	Very brief	Occasional
		December	---	---	Very brief	Occasional
BaF:						
Barfield	D	Jan-Dec	---	---	---	None
Gladdice	C	Jan-Dec	---	---	---	None
BcD:						
Barfield	D	Jan-Dec	---	---	---	None
BeB2:						
Bewleyville	B	Jan-Dec	---	---	---	None
BeC2:						
Bewleyville	B	Jan-Dec	---	---	---	None
CrB2:						
Christian	C	Jan-Dec	---	---	---	None
CrC2:						
Christian	C	Jan-Dec	---	---	---	None
CrD2:						
Christian	C	Jan-Dec	---	---	---	None
DaF:						
Dellrose	B	Jan-Dec	---	---	---	None
Mimosa	C	Jan-Dec	---	---	---	None
DeC:						
Dellrose	B	Jan-Dec	---	---	---	None
DeD2:						
Dellrose	B	Jan-Dec	---	---	---	None
DeE:						
Dellrose	B	Jan-Dec	---	---	---	None
DkB2:						
Dickson	C	January	1.5-2.0	---	---	None
		February	1.5-2.0	---	---	None
		March	1.5-2.0	---	---	None
		April	1.5-2.0	---	---	None
		December	1.5-2.0	---	---	None

Table 19.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table		Flooding	
			Upper limit	Lower limit	Duration	Frequency
			Ft	Ft		
DkC2:						
Dickson	C	January	1.5-2.0	---	---	None
		February	1.5-2.0	---	---	None
		March	1.5-2.0	---	---	None
		April	1.5-2.0	---	---	None
		December	1.5-2.0	---	---	None
HaD:						
Hawthorne	B	Jan-Dec	---	---	---	None
HaF:						
Hawthorne	B	Jan-Dec	---	---	---	None
HdF:						
Hawthorne	B	Jan-Dec	---	---	---	None
HoB:						
Holston	B	Jan-Dec	---	---	---	None
HoC2:						
Holston	B	Jan-Dec	---	---	---	None
HoD2:						
Holston	B	Jan-Dec	---	---	---	None
HoD3:						
Holston	B	Jan-Dec	---	---	---	None
HuB:						
Humphreys	B	January	5.0-6.0	>6.0	---	None
		February	5.0-6.0	>6.0	---	None
		March	5.0-6.0	>6.0	---	None
		December	5.0-6.0	>6.0	---	None
HuC:						
Humphreys	B	January	5.0-6.0	>6.0	---	None
		February	5.0-6.0	>6.0	---	None
		March	5.0-6.0	>6.0	---	None
		December	5.0-6.0	>6.0	---	None
Ld:						
Lindside	C	January	1.6-2.5	>6.0	Very brief	Occasional
		February	1.6-2.5	>6.0	Very brief	Occasional
		March	1.6-2.5	>6.0	Very brief	Occasional
		April	1.6-2.5	>6.0	Very brief	Occasional
		December	1.6-2.5	>6.0	Very brief	Occasional
MmB2:						
Mimosa	C	Jan-Dec	---	---	---	None
MmC2:						
Mimosa	C	Jan-Dec	---	---	---	None
MmD2:						
Mimosa	C	Jan-Dec	---	---	---	None

Table 19.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table		Flooding	
			Upper limit	Lower limit	Duration	Frequency
			Ft	Ft		
Mn:						
Minter	D	January	0.0	5.7-6.6	Long	Occasional
		February	0.0	5.7-6.6	Long	Occasional
		March	0.0	5.7-6.6	Long	Occasional
		April	0.0	5.7-6.6	Long	Occasional
		May	0.0	5.7-6.6	---	None
		November	0.0	5.7-6.6	---	None
		December	0.0	5.7-6.6	Long	Occasional
MtB2:						
Mountview	B	January	1.5-2.1	1.8-2.1	---	None
		February	1.5-2.1	1.8-2.1	---	None
		March	1.5-2.1	1.8-2.1	---	None
		December	1.5-2.1	1.8-2.1	---	None
MtC2:						
Mountview	B	January	1.5-2.1	1.8-2.1	---	None
		February	1.5-2.1	1.8-2.1	---	None
		March	1.5-2.1	1.8-2.1	---	None
		December	1.5-2.1	1.8-2.1	---	None
Oc:						
Ocana	B	January	---	---	Very brief	Occasional
		February	---	---	Very brief	Occasional
		March	---	---	Very brief	Occasional
		December	---	---	Very brief	Occasional
Sk:						
Skidmore	B	January	3.0-4.0	>6.0	Very brief	Occasional
		February	3.0-4.0	>6.0	Very brief	Occasional
		March	3.0-4.0	>6.0	Very brief	Occasional
		April	---	---	Very brief	Occasional
		May	---	---	Very brief	Occasional
		December	3.0-4.0	>6.0	Very brief	Occasional
St:						
Staser	B	January	---	---	Very brief	Occasional
		February	---	---	Very brief	Occasional
		March	---	---	Very brief	Occasional
		December	---	---	Very brief	Occasional
SuC2:						
Sugargrove	B	Jan-Dec	---	---	---	None
SuD2:						
Sugargrove	B	Jan-Dec	---	---	---	None
SwB:						
Swafford	C	January	1.8-2.4	---	---	None
		February	1.8-2.4	---	---	None
		March	1.8-2.4	---	---	None
		April	1.8-2.4	---	---	None
		December	1.8-2.4	---	---	None
SwC:						
Swafford	C	January	1.8-2.4	---	---	None
		February	1.8-2.4	---	---	None
		March	1.8-2.4	---	---	None
		April	1.8-2.4	---	---	None
		December	1.8-2.4	---	---	None

Table 19.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table		Flooding	
			Upper limit	Lower limit	Duration	Frequency
			Ft	Ft		
SyB2:						
Sykes	B	Jan-Dec	---	---	---	None
SyC2:						
Sykes	B	Jan-Dec	---	---	---	None
Ud:						
Udarents.						

Table 20.--Classification of the Soils

Soil name	Family or higher taxonomic class
Armour	Fine-silty, mixed, active, thermic Ultic Hapludalfs
Arrington	Fine-silty, mixed, superactive, thermic Cumulic Hapludolls
Barfield	Clayey, mixed, active, thermic Lithic Hapludolls
Bewleyville	Fine-silty, siliceous, semiactive, thermic Typic Paleudults
Christian	Clayey, mixed, semiactive, mesic Typic Hapludults
Dellrose	Fine-loamy, mixed, semiactive, thermic Humic Hapludults
Dickson	Fine-silty, siliceous, semiactive, thermic Glossic Fragiudults
Gladdice	Fine, mixed, active, thermic Vertic Hapludalfs
Hawthorne	Loamy-skeletal, siliceous, semiactive, thermic Typic Dystrudepts
Holston	Fine-loamy, siliceous, semiactive, thermic Typic Paleudults
Humphreys	Fine-loamy, siliceous, semiactive, thermic Humic Hapludults
Lindside	Fine-silty, mixed, active, mesic Fluvaquentic Eutrudepts
Mimosa	Fine, mixed, semiactive, thermic Typic Hapludalfs
Minter	Fine, mixed, semiactive, thermic Typic Endoaqualfs
Mountview	Fine-silty, siliceous, semiactive, thermic Oxyaquic Paleudults
Ocana	Fine-loamy, mixed, active, thermic Dystric Fluventic Eutrudepts
Skidmore	Loamy-skeletal, mixed, semiactive, mesic Dystric Fluventic Eutrudepts
Staser	Fine-loamy, mixed, active, thermic Cumulic Hapludolls
Sugargrove	Fine-loamy, mixed, semiactive, thermic Typic Hapludults
Swafford	Fine-loamy, siliceous, semiactive, thermic Fragiaquic Paleudults
Sykes	Fine-silty, mixed, active, thermic Typic Paleudalfs
Udarents	Clayey Udarents

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