United States Department of Agriculture

Soil Conservation Service

In cooperation with United States Department of Agriculture Forest Service and the Arkansas Agricultural Experiment Station

Soil Survey of Clark and Hot Spring Counties, Arkansas

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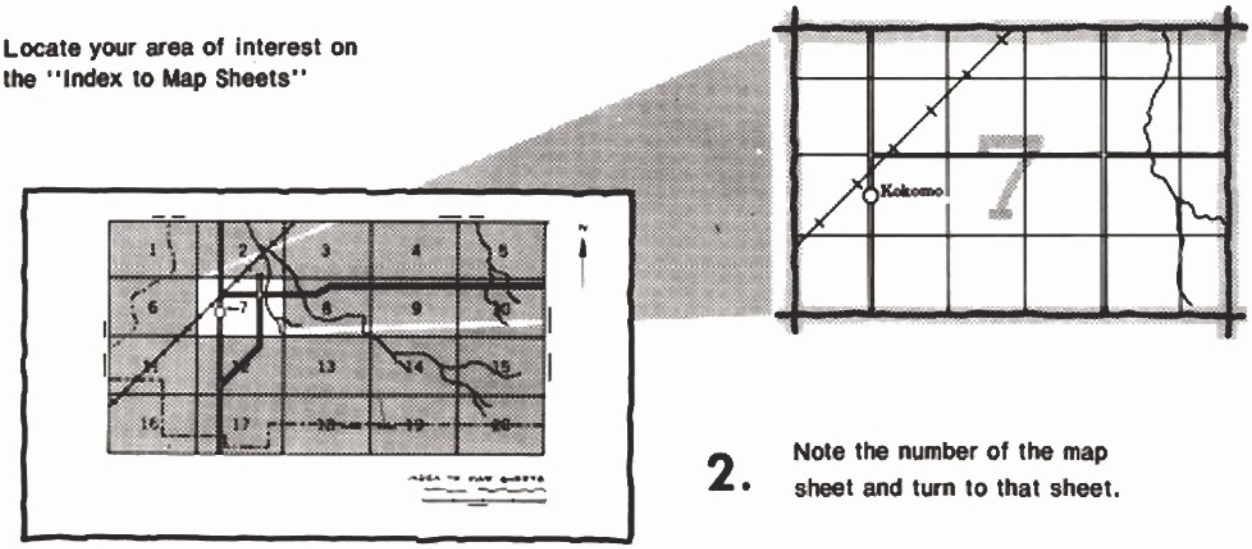

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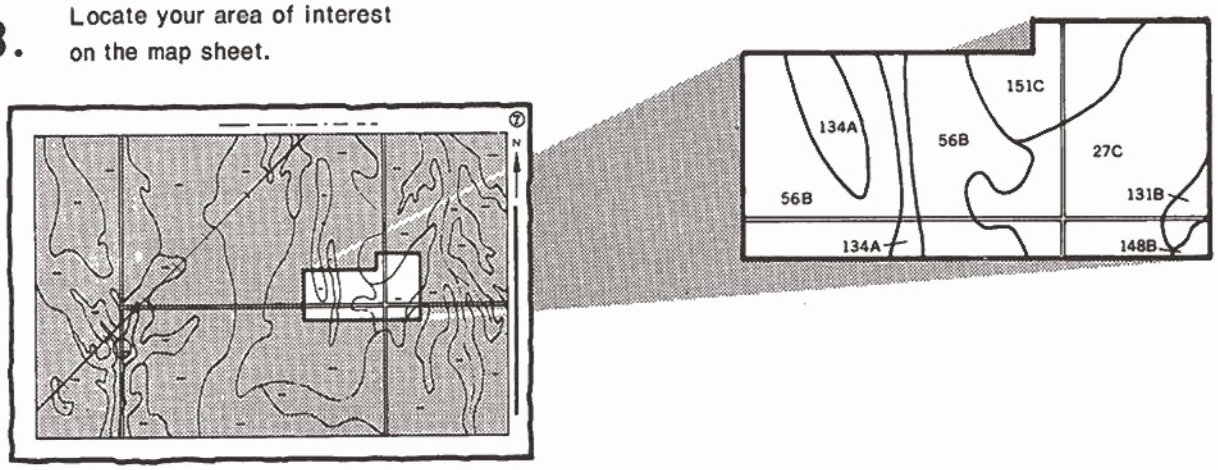

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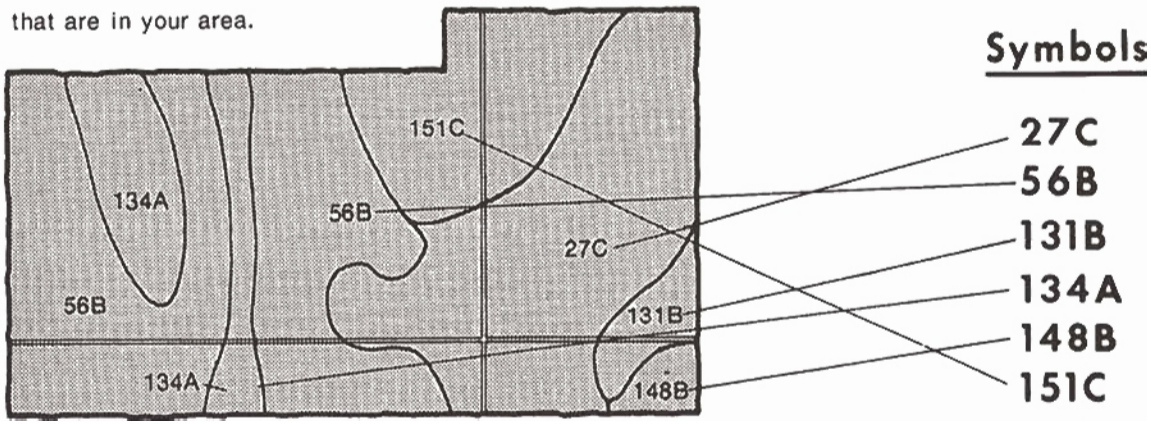

THIS SOIL SURVEY

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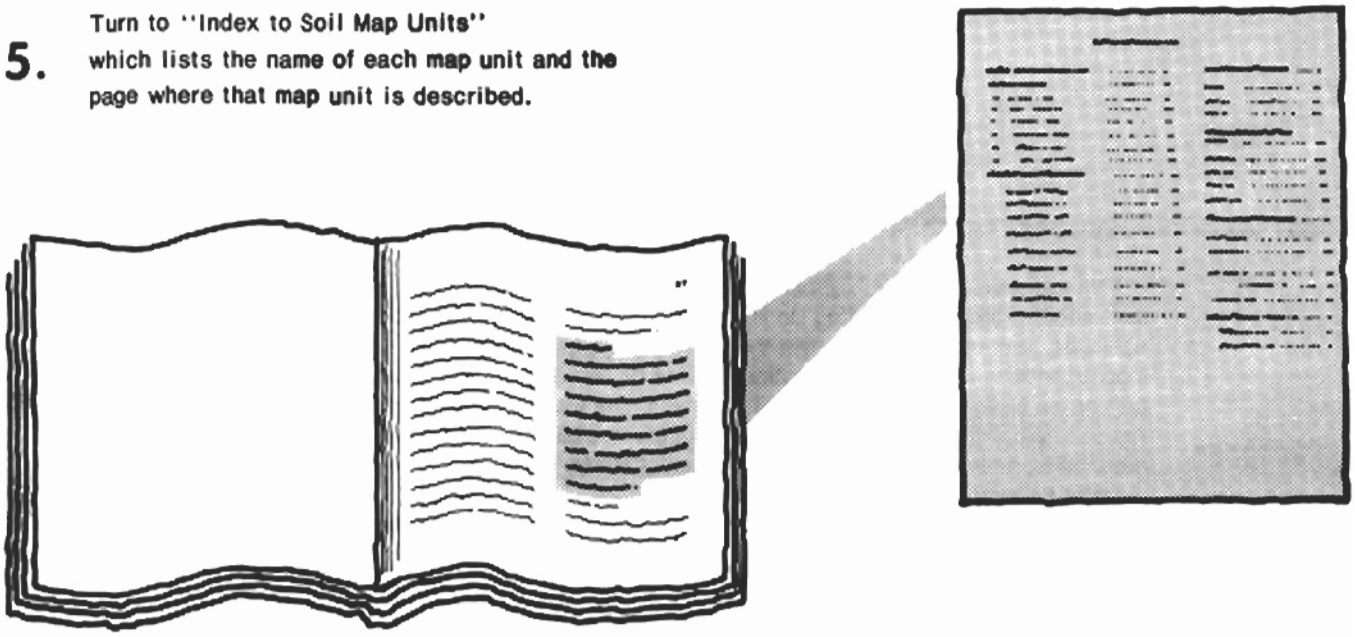
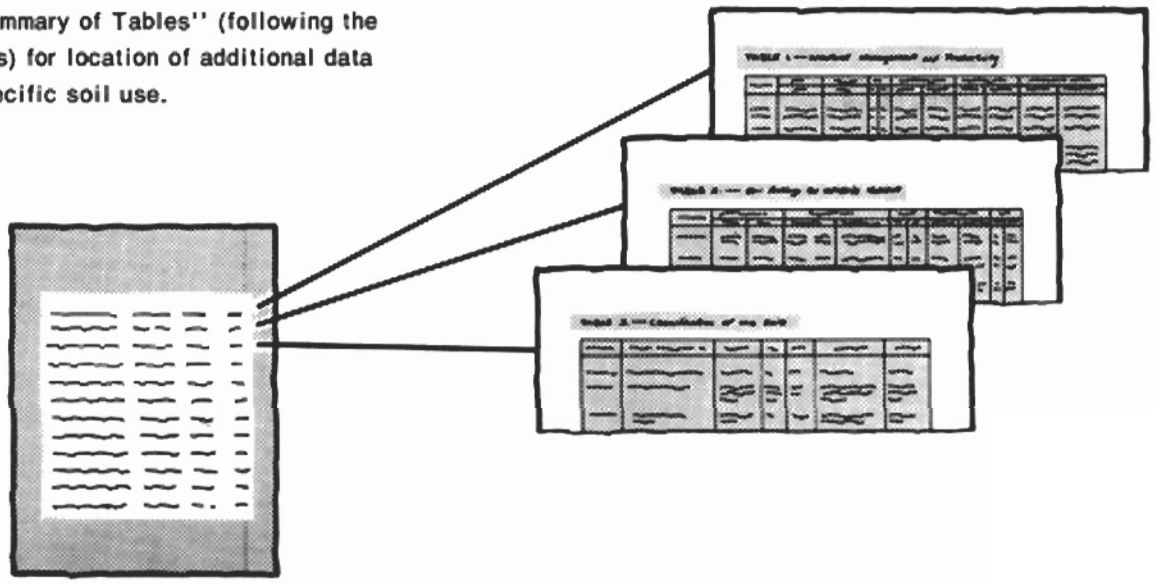


6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

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 Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in 1982. Soil names and descriptions were approved in 1983. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1983. This soil survey was made cooperatively by the Soil Conservation Service and the United States Department of Agriculture, Forest Service, and the Arkansas Agricultural Experiment Station. It is part of the technical assistance furnished to the Clark County Conservation District and the Hot Spring County 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: Managed stands of commercial trees are in both Clark and Hot Spring Counties, and the economy is based on this use. This well managed stand of loblolly pine is on Smithdale fine sandy loam, 3 to 8 percent slopes.

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Foreword

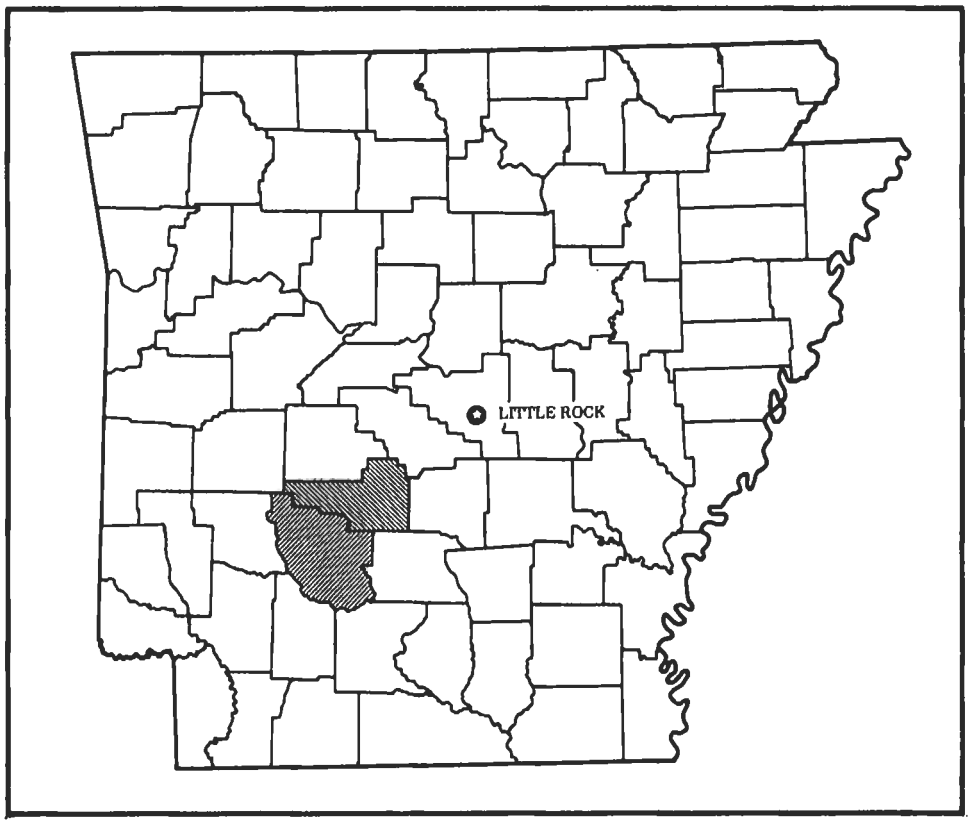
This soil survey contains information that can be used in land-planning programs in Clark and Hot Spring Counties. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations,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

This soil survey is designed for many different users. Farmers, ranchers, 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 insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow 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 Soil Conservation Service or the Cooperative Extension Service.

Jack C. Davis
State Conservationist
Soil Conservation Service



Location of Clark and Hot Spring Counties in Arkansas.

Soil Survey of Clark and Hot Spring Counties, Arkansas

By James E. Hoelscher, Soil Conservation Service

Fieldwork by James E. Hoelscher, Mickey D. Ransom, Alex L. Winfrey, Mozell Williams, Ronald K. Rhodes, Clarence E. McFadden, and Katherine K. Guion
Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service
In cooperation with
the United States Department of Agriculture, Forest Service,
and the Arkansas Agricultural Experiment Station

CLARK and HOT SPRING COUNTIES are adjoining counties in southwest Arkansas.

Clark County is roughly oblong. From northwest to southeast, it is about 50 miles long. From east to west, it is about 30 miles wide. The county is bounded on the north by Hot Spring and Montgomery Counties, on the south by Nevada and Ouachita Counties, on the east by Dallas County, and on the west by Pike County. The Ouachita River forms a common boundary between parts of Clark and Dallas Counties. The Little Missouri River forms a common boundary between parts of Clark, Nevada, and Ouachita Counties. The Antoine River forms a common boundary between parts of Clark and Pike Counties.

The total acreage of Clark county is about 565,190 acres, or about 883 square miles. This includes 10,540 acres that are bodies of water of more than 40 acres and streams that are more than one-eighth of a mile wide. The total land area is about 554,650 acres.

In 1980 the population of Clark County was 23,326. Arkadelphia is the county seat and the main trade center. It has a population of 10,005. Other smaller towns and communities include Amity with a population of 859; Caddo Valley with a population of 388; Gum Springs with a population of 255; Gurdon with a population of 2,707; Okolona with a population of 200; and Whelen Springs with a population of 156.

The economy of Clark County mainly is based on forestry, livestock, and crop production. Some major manufacturing plants are in Arkadelphia, Gurdon, Gum Springs, and Amity. Henderson State University and Ouachita Baptist University are in Arkadelphia.

Hot Spring County is basically elongated. From east to west, it is about 45 miles long. From north to south, it is about 20 miles wide. The westernmost part of the county is very narrow in width. The county is bounded on the north by Garland and Saline Counties, on the south by Clark and Dallas Counties, on the east by Grant County, and on the west by Montgomery County. The Caddo River is inundated by DeGray Lake and the Ouachita River, and it forms a common boundary between parts of Hot Spring and Clark Counties.

The total acreage of Hot Spring County is about 398,067 acres or 622 square miles. This includes 4,461 acres that are bodies of water of more than 40 acres and streams that are more than one-eighth of a mile wide. The total land area is about 393,606 acres.

In 1980 the population of Hot Spring County was 26,819. Malvern is the county seat and main trade center. It has a population of 10,163. Other smaller towns and communities include Rockport with a population of 231; Friendship with a population of 163; and Perla with a population of 149.

The economy of Hot Spring County mainly is based on forestry, livestock, and crop production. Some major manufacturing plants are in Malvern and Jones Mill.

General Nature of the Survey Area

This section discusses farming, physiography and drainage, and climate in Clark and Hot Spring Counties.

Farming

The first settlers in Clark and Hot Spring Counties were mostly subsistence farmers. They cleared and farmed small scattered areas of gently sloping upland. The deep soil on this land contained little gravel and few stones. Some of the settlers farmed the better drained flood plains along the rivers and major streams. The Blackland Prairie areas of Clark County were originally in prairie grasses. These areas were converted to farms very early. As roads were built and markets developed, more of the flood plains and uplands were cleared, and cotton, corn, small grains, and livestock were produced for cash sale. The early settlers also harvested and sold the virgin pine and hardwood timber.

This trend continued until about 1930. From the 1930's through the early 1950's, numerous farms were abandoned. Many of these farms were purchased by the large timber companies and planted to pine or converted to pine forests through natural reseeding. On most of the remaining individual farms, land use changed from cultivated crops to pasture or meadow. In the 1970's, more of the flood plains were cleared, drained, and used for row crops and forage production.

According to the 1978 Census of Agriculture, about 24 percent of Clark County was in farms. The average size of a farm was about 268 acres. About 20 percent of Hot Spring County was in farms, and the average size of a farm was about 162 acres.

The remainder of the land in Clark and Hot Spring Counties is in commercial woodland, towns, rural subdivisions, federally owned land, lakes, transportation, and utility facilities. In some areas are unimproved woodland.

The number of farms in Clark and Hot Spring Counties has gradually decreased because some of the larger farmowners have purchased the adjacent smaller farms. In addition, commercial timber companies also have purchased the small farms and converted them to woodland for pine production.

Most farm income is from the sale of livestock, row crops, and timber products. The cattle industry consists mainly of cow-calf operations. Table 1 shows the number of livestock on farms in 1982 *(10)*. Most calves are weaned and sold or are kept and sold the following year as stockers to feedlots in the Midwest. They are raised on cool- and warm-season pastures and are fed mineral and protein supplements. Generally, hay and some grain are fed only in the winter. The production of swine has remained fairly stable. A few farms produce poultry, and there has been a slight increase in the production of broilers in recent years.

Commercial timber companies produce, harvest, and process large quantities of pine timber in Clark and Hot Spring Counties. The sale of forest products is also an important source of farm income. Some of the woodland is on steep, stony, or shallow soils. These areas are poor sites for commercial timber production; however, woodland is the best use of these soils. Some excellent pine production is on private farms in the Coastal Plain parts of Clark and Hot Spring Counties. Most of the pine is sold locally to the large commercial mills and processed into construction lumber. Some of the timber is treated and sold for post and wood fencing. Most of the hardwood timber is sold locally and sawed into railroad ties, hardwood flooring, pallets, and furniture stock.

A small part of northwest Hot Spring County is in the Ouachita National Forest. This area is managed for multiple use including timber production.

The major crops in Clark and Hot Spring Counties include soybeans, wheat, and rice. These crops are grown primarily on flood plains along the major rivers and on the adjoining terraces. Table 2 shows acreages of principal crops in Clark and Hot Spring Counties in 1981 *(10)*. Improved pasture and hayland occur throughout the entire area.

Only about one-fourth of the farmowners in Clark and Hot Spring Counties are full-time operators. Most have off-the-farm jobs or are retired. Some people moving into the county buy small acreages in rural areas and farm as a hobby.

Physiography and Drainage

Clark County is within three physiographic areas, and Hot Spring County is within two physiographic areas. The Ouachita Mountains is the oldest of the three areas and cover the northwestern part of Clark County and the western part of Hot Spring County. The Coastal Plain is the youngest of the three areas and covers the central and southern parts of Clark County and the eastern part of Hot Spring County. Scattered throughout the Coastal Plain in Clark County is the Blackland Prairie. The Blackland Prairie is intermediate in age.

The Ouachita Mountains are characterized by gently sloping to very steep upland ridgetops typically oriented in an east to west direction. Sandstone and shale fragments and stones generally are on the surface. There are occasional rock outcrops. Slopes range from gently sloping to very steep. The area has been intricately dissected by streams. In Hot Spring County, elevation ranges from about 250 feet above sea level southwest of Friendship to about 1,280 feet above sea level north of Bismarck. The lower side slopes generally have intermingled sandstone and shale bedrock exposed that is fractured and tilted at about 45 degrees. Shale bedrock is dominant on the valley floors. The upper side slopes and low ridges generally have sandstone bedrock

exposed. Some shale is intermingled in the soils on these slopes and ridges. The very highest ridgetops typically have chert and novaculite bedrock exposed. Carnasaw and Sherwood soils are typical of the soils that formed in residuum from the sandstone and shale. Bigfolk and Yanush soils are typical of the soils that formed in the residuum and colluvium from the chert and novaculite.

Stream valleys in the Ouachita Mountains are entrenched and range from about 100 feet in width to as much as 1,300 feet. Generally, the flood plain is about evenly divided on each side of the stream. Ceda and Toine soils formed in the gravelly and loamy alluvium.

The Coastal Plain is characterized by level to moderately steep uplands that formed from marine sediment. Rounded and subrounded gravel is common in some areas. The slope ranges from level to moderately steep. The area has been intricately dissected by streams. In Clark County, elevation ranges from about 120 feet above sea level in the bottom land south of Vaden to about 520 feet above sea level on the uplands near Okolona. Coastal Plain remnants are sometimes found as a very thin to very thick mantle underlain by Ouachita Mountain bedrock in the transition zone between the Coastal Plain and the Ouachita Mountains. Saffell, Sacul, and Smithdale soils are typical of the soils that formed on the Coastal Plain uplands.

Stream valleys in the Coastal Plain are somewhat entrenched and range from a few hundred feet in width to as much as 5 miles. Generally, the flood plain is about evenly divided on each side of the stream. Ouachita and Sardis soils are typical of the soils of the Coastal Plain bottom lands.

Intermingled throughout most of the Coastal Plain of Clark County area is the Blackland Prairie. The area is characterized by nearly level to moderately steep, eroded to severely eroded uplands. Fossils are relatively abundant, and chalk outcrops are common. The area has been intricately dissected by streams. Elevation ranges from about 175 feet above sea level on the flood plains to about 380 feet above sea level on the uplands. The uplands are underlain by marl or chalk bedrock. Vegetation is predominantly prairie grasses and a few scattered hardwoods and pines. Sumter, Houston, and Oktibbeha soils are typical of upland soils that formed in the Blackland Prairie. Stream valleys in the Blackland Prairie are somewhat entrenched and range from about 100 to 1,300 feet wide. Marietta, Terouge, and Urbo soils are typical bottom land soils of the Blackland Prairie.

Four major rivers flow through Clark County. The Caddo River flows in a general southeasterly direction across the northern part of the county and empties into the Ouachita River east of Caddo Valley. The Caddo River and DeGray Lake drain most of northern Clark County. DeGray Lake is a large manmade lake constructed on the river. The largest river in the county is the Ouachita River. It flows in a southerly direction along the east side of the county. Many smaller streams empty into the river and drain the east side of the county. The Ouachita River forms a common border with Hot Spring County for a few miles along the northeast part of the county, and it forms a common border with Dallas County for several miles along the southeast part of the county. The Antoine River forms a common border with Pike County along the southwest side of the county. Numerous perennial and intermittent streams drain the west side of Clark County. These streams flow into the Antoine River. The Little Missouri River forms a common border with Nevada and Ouachita Counties along the south part of Clark County. Numerous small streams and manmade ditches drain the southern part of Clark County. These streams and ditches flow into the Little Missouri River. Much of the interior of Clark County is drained by many perennial and intermittent streams and manmade ditches that empty into Terre Noir Creek. Terre Noir Creek flows into the Little Missouri River in the southeast corner of Clark County. The Little Missouri River and the Ouachita River converge a few miles downstream.

The Ouachita River is the major stream that flows through Hot Spring County. It flows in a southerly direction through the middle of the county. The interior of Hot Spring County is drained by numerous perennial and intermittent streams that flow into the Ouachita River. The east side of Hot Spring County is drained by many perennial and intermittent streams that flow into the Saline River further to the east. The southeast part of Hot Spring County is drained by numerous streams that flow into the Ouachita River further south. The northwest part of the county is drained by numerous streams that flow north into Lake Hamilton in Garland County. Southwestern Hot Spring County is drained by numerous small streams that flow into DeGray Lake and also by Holly Creek and Caney Creek that flow into DeRoche Creek. DeRoche Creek forms a common border with Clark County, and it empties into the Ouachita River just before it leaves Hot Spring County.

Domestic water sources are the Ouachita and Caddo Rivers, drilled and dug wells, and springs. Springs are common in many areas, and they contribute substantially to streamflow in the summer and fall. Water for livestock is from farm ponds and creeks.

Climate

Climatic data prepared by the National Climatic Center, Asheville, North Carolina.

Clark and Hot Spring Counties have long, hot summers because moist, tropical air from the Gulf of Mexico persistently covers the area. Winters are cool and fairly short with only a rare cold wave that moderates in 1 or 2 days. Precipitation is fairly heavy throughout the year. Summer precipitation, mainly

afternoon thunderstorms, is generally adequate for the growing of crops.

Table 3 gives data on temperature and precipitation for the survey area as recorded at Arkadelphia in the period 1951 to 1980. Table 4 shows probable dates of the first freeze in fall and the last freeze in spring. Table 5 provides data on length of the growing season.

In winter the average temperature is 44 degrees F, and the average daily minimum temperature is 33 degrees. The lowest temperature on record, which occurred at Arkadelphia on February 2, 1951, is -6 degrees. In summer the average temperature is 80 degrees, and the average daily maximum temperature is 92 degrees. The highest recorded temperature, which occurred at Arkadelphia on July 16, 1954, is 112 degrees.

Growing degree days are shown in table 3. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 54 inches. Of this, 27 inches, or 50 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 20 inches. The heaviest 1-day rainfall during the period of record was 5.65 inches at Arkadelphia on September 16, 1964. Thunderstorms occur on about 56 days each year, and most occur in summer.

The average seasonal snowfall is 3 inches. The greatest snow depth at any one time during the period of record was 5 inches. On an average of 1 day, at least 1 inch of snow is on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The sun shines 95 percent of the time possible in summer and 80 percent in winter. The prevailing wind is from the southwest. Average windspeed is highest, 10 miles per hour, in spring.

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

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of bedrock. They 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 from 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 in the survey area occur in an orderly pattern that is related to the geology, the landforms, relief, climate, and the natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with considerable accuracy the kind of soil at a specific location on the landscape.

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

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, acidity, 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. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area are generally collected for laboratory analyses and for engineering tests. Soil scientists interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties in terms of expected behavior of the soils

under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and new interpretations sometimes are developed to meet local needs. Data were 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 were 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 state with a fairly high degree of probability that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will 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.

Map Unit Composition

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

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

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

General Soil Map Units

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

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

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

The soils in the survey area vary widely in their suitability for major land uses.

Each map unit is rated for *cultivated crops, pasture crops, woodland,* and *urban uses*. Cultivated crops are those grown extensively in the survey area. Pasture crops are those grown for livestock forage production. Woodland refers to areas of native or introduced trees. Urban uses include residential, commercial, and industrial developments.

Soil Descriptions for Clark County

1. Zafra-Carnasaw-Pirum

Deep and moderately deep, well drained, gently sloping to steep, gravelly and stony soils that formed in residuum of interbedded sandstone and shale

These soils are in the northern part of the county. They are on ridgetops, side slopes, and valley floors of the Ouachita Mountains.

This map unit makes up about 17 percent of Clark County. It is about 28 percent Zafra soils, 23 percent Carnasaw soils, 16 percent Pirum soils, and 33 percent soils of minor extent.

The moderately deep to deep, gently sloping to steep Zafra soils are on side slopes. They have a dark grayish brown stony fine sandy loam surface layer and a yellowish brown very gravelly fine sandy loam subsurface layer. The upper part of the subsoil is yellowish brown very gravelly loam. The lower part is yellowish red very gravelly sandy clay loam. The underlying material is soft sandstone that grades to hard sandstone.

The deep, gently sloping to steep Carnasaw soils are on side slopes and valley floors. They have a dark brown gravelly silt loam surface layer. The upper part of the subsoil is yellowish red silty clay. The lower part is red silty clay. Below that is weakly cemented, acid shale that has thin layers of sandstone.

The moderately deep to deep, gently sloping to moderately steep Pirum soils are on ridgetops. They have a dark grayish brown gravelly fine sandy loam surface layer. The upper part of the subsoil is brownish yellow fine sandy loam. The lower part is yellowish brown loam. Below that is hard, tilted and fractured sandstone bedrock.

Of minor extent in this map unit are Toine, Ceda, Bonnerdale, Bismarck, Sherwood, Sherless, Shermore, Clebit, Yanush, and Bigfork soils. Toine and Ceda soils are on flood plains. Bonnerdale soils are on concave foot slopes. Bismarck, Sherwood, Sherless, and Shermore soils are on broad uplands. The moderately sloping to steep Clebit, Yanush, and Bigfork soils are on side slopes.

The soils in this map unit are used mainly as woodland. A few ridges and valley floors have been cleared and are used for pasture or for hay. The remaining acreage is in mixed pines and hardwoods. Slope, stones, and depth to bedrock are the main limitations to farming and most other uses.

Zafra soils are not suited to cultivated crops. Carnasaw soils are poorly suited to not suited to cultivated crops because of the slope. Pirum soils are moderately suited to not suited to cultivated crops because of the slope. Zafra soils are not suited to improved pasture. Carnasaw soils are moderately suited to not suited to improved pasture, and Pirum soils are well suited to not suited to improved pasture. The potential productivity of Zafra soils for commercial wood crops is moderate, and for Pirum and Carnasaw soils, it is moderately high.

Zafra, Carnasaw, and Pirum soils are moderately suited to poorly suited to most urban uses. Slope, depth to bedrock, and slow permeability are the main limitations.

2. Bonnerdale-Toine-Pirum

Deep and moderately deep, well drained and somewhat poorly drained, level to gently sloping, loamy or gravelly soils that formed in loamy sediment underlain by interbedded sandstone and shale, in alluvium, or in residuum of sandstone that has lenses of shale

These soils are in the northwestern part of the county. They are on upland ridges, foot slopes, flood plains, low terraces, and valley floors of the Ouachita Mountains.

This map unit makes up about 8 percent of Clark County. It is about 33 percent Bonnerdale soils, 23 percent Toine soils, 23 percent Pirum soils, and 21 percent soils of minor extent.

The deep, somewhat poorly drained, level to gently sloping Bonnerdale soils are on valley floors and concave, upland foot slopes. They have a brown fine sandy loam surface layer. The upper part of the subsoil is yellowish brown, mottled fine sandy loam. The middle part is mottled strong brown and light brownish gray fine sandy loam. The lower part is mottled strong brown and light brownish gray loam. The underlying material is gray clay loam. Below that is weakly cemented, fractured, acid shale bedrock.

The deep, well drained, level to nearly level Toine soils are on flood plains and low terraces. The upper part of the surface layer is dark brown fine sandy loam, and the lower part is dark yellowish brown fine sandy loam. The upper part of the subsoil is dark yellowish brown sandy clay loam. The middle part is yellowish brown, mottled sandy clay loam. The lower part is yellowish brown, mottled fine sandy loam.

The moderately deep to deep, well drained, gently sloping Pirum soils are on low ridgetops. They have a dark grayish brown gravelly fine sandy loam surface layer. The upper part of the subsoil is brownish yellow fine sandy loam. The lower part is yellowish brown loam. Below that is hard, tilted and fractured sandstone bedrock.

Of minor extent in this map unit are Ceda, Shermore, Carnasaw, Sherless, Sherwood, Bismarck, Zafra, and Clebit soils. Ceda soils are on flood plains. Shermore soils are on broad ridgetops. Carnasaw, Sherless, Sherwood, and Bismarck soils are on side slopes and valley floors. The stony Zafra and Clebit soils are on narrow ridgetops.

The soils in this map unit are used mainly for pasture or as woodland. A few small areas are in cultivated crops. Originally, most of the acreage was in mixed upland hardwoods and pines. Slope, depth to rock, and wetness are the main limitations to farming and most other uses.

Bonnerdale and Toine soils are well suited to cultivated crops, and Pirum soils are moderately suited to cultivated crops. Bonnerdale, Toine, and Pirum soils are well suited to pasture. The potential productivity of Toine soils for commercial woods crops is high, and for Bonnerdale and Pirum soils, it is moderately high.

Bonnerdale and Toine soils are poorly suited to most urban uses. Wetness caused by the high water table is the main limitation to urban use of Bonnerdale soils. Flooding is the main limitation of Toine soils. Pirum soils are moderately suited to most urban uses. Depth to bedrock is the main limitation of Pirum soils.

3. Saffell-Sacul-Pikeville

Deep, well drained and moderately well drained, nearly level to moderately steep, gravelly or loamy soils that formed in marine sediment

These soils are in the central and northeastern part of the county. They are on broad uplands, ridgetops, and side slopes of the Coastal Plain.

This map unit makes up about 8 percent of Clark County. It is about 35 percent Saffell soils, 24 percent Sacul soils, 17 percent Pikeville soils, and 24 percent soils of minor extent.

The well drained, gently sloping to moderately steep Saffell soils are on hilltops and upper side slopes. They have a dark grayish brown gravelly fine sandy loam surface layer. The upper part of the subsoil is yellowish brown gravelly fine sandy loam. The lower part is yellowish red very gravelly sandy clay loam. Below that is reddish yellow extremely gravelly sandy loam.

The moderately well drained, gently sloping to moderately steep Sacul soils are on side slopes. They have a dark grayish brown fine sandy loam surface layer and a yellowish brown fine sandy loam subsurface layer. The upper part of the subsoil is red silty clay. The middle part is yellowish red, mottled silty clay. The lower part is mottled gray and yellowish red silty clay loam.

The well drained, nearly level to gently sloping Pikeville soils are on broad hilltops. They have a dark brown fine sandy loam surface layer. The upper part of the subsoil is yellowish red loam. The middle part is red gravelly loam. The lower part is red extremely gravelly loam.

Of minor extent in this map unit are Bowie, Ora, and Savannah soils. These soils are on the broad hilltops and upper side slopes.

The soils in this map unit are used mainly as woodland or for pasture. A few small areas are in cultivated crops. Originally, most of the acreage was in mixed hardwoods and pines. Slope and wetness are the main limitations to farming and most other uses. Erosion is a severe hazard to use of these soils for farming and most other uses.

Saffell soils are moderately suited to not suited to cultivated crops. Sacul soils are poorly suited to not suited to cultivated crops, and Pikeville soils are moderately suited to cultivated crops. Saffell and Sacul soils are moderately suited to pasture, and Pikeville soils are well suited to pasture. The potential productivity of Sacul and Pikeville soils for commercial wood crops is moderately high, and for Saffell soils, it is moderate.

Saffell soils are well suited to most urban uses. Slope and moderate permeability are the only limitations. Sacul soils are poorly suited to most urban uses. Slow permeability, slope, wetness, and high shrink-swell potential are the main limitations. Pikeville soils are well suited to most urban uses. These soils have no significant limitations.

4. Sacul-Savannah-Smithdale

Deep, moderately well drained and well drained, nearly level to moderately steep, loamy soils that formed in marine sediment

These soils are scattered through the central and southern part of the county. They are on broad uplands, ridgetops, and side slopes of the Coastal Plain.

This map unit makes up about 15 percent of Clark County. It is about 30 percent Sacul soils, 25 percent Savannah soils, 10 percent Smithdale soils, and 35 percent soils of minor extent.

The moderately well drained, gently sloping to moderately steep Sacul soils are on ridgetops and dissected side slopes. They have a dark grayish brown fine sandy loam surface layer and a yellowish brown fine sandy loam subsurface layer. The upper part of the the subsoil is red silty clay. The middle part is yellowish red, mottled silty clay. The lower part is mottled gray and yellowish red silty clay loam.

The moderately well drained, nearly level to gently sloping Savannah soils are on broad uplands. They have a dark brown fine sandy loam surface layer and a brown subsurface layer. The upper part of the subsoil is yellowish brown loam. The next part is a mottled light brownish gray, yellowish brown, and red loam fragipan. The next part is a mottled red, gray, and yellowish brown loam fragipan. The lower part is a red, gray, and brownish yellow sandy clay loam fragipan.

The well drained, gently sloping to moderately steep Smithdale soils are on uniform side slopes. They have a brown fine sandy loam surface layer. The upper part of the subsoil is yellowish red sandy clay loam. The lower part is yellowish red sandy loam.

Of minor extent in this map unit are Bowie, Ora, Ruston, and Sawyer soils. Bowie and Ora soils are on broad uplands. Ruston soils are on broad ridgetops. Sawyer soils are on uniform side slopes.

The soils in this map unit are used mainly as woodland or for pasture. A few small areas are in cultivated crops. Originally, most of the acreage was in mixed hardwoods and pines. Slope and wetness are the main limitations to farming and most other uses, and erosion is a severe hazard.

Sacul soils are poorly suited to cultivated crops. Savannah and Smithdale soils are moderately suited to cultivated crops. Sacul soils are moderately suited to pasture, and Savannah and Smithdale soils are well suited to pasture. The potential productivity of these soils for commercial wood crops is moderately high.

Sacul soils are poorly suited to most urban uses. Slow permeability, slope, wetness, and high shrink-swell potential are the main limitations. Savannah soils are moderately suited to most urban uses. Moderately slow permeability, slope, and wetness are the main limitations. Smithdale soils are well suited to most urban uses. The only limitations of Smithdale soils are moderate permeability and slope.

5. Oktibbeha-Macon-Sacul

Deep and moderately deep, moderately well drained and well drained, gently sloping to moderately steep, loamy soils that formed in marine sediment or in marine sediment underlain by chalk or marl

These soils are scattered throughout the central part of the county. They are on broad uplands, on ridgetops, and on side slopes of transitional areas that are between the Coastal Plain and the Blackland Prairie.

This map unit makes up about 8 percent of Clark County. It is about 33 percent Oktibbeha soils, 21 percent Macon soils, 18 percent Sacul soils, and 28 percent soils of minor extent.

The moderately deep to deep, moderately well drained, gently sloping to moderately sloping Oktibbeha soils are on eroded ridgetops and dissected side slopes on margins of the Blackland Prairie. They have a brown fine sandy loam surface layer. The upper part of the subsoil is yellowish red, mottled clay. The lower part is mottled yellowish brown and light brownish gray clay. The underlying material is mottled light olive brown and yellowish brown clay. Below that is soft, platy, olive brown chalk.

The deep, well drained, gently sloping to moderately steep Macon soils are on ridgetops and hillsides on margins of the Blackland Prairie. They have a dark grayish brown fine sandy loam surface layer. The upper part of the subsoil is yellowish red clay loam. The middle part is yellowish red, mottled clay loam. The lower part is strong brown and yellowish brown, mottled sandy clay loam.

The deep, moderately well drained, gently sloping to moderately steep Sacul soils are on hilltops and side slopes on margins of the Coastal Plain. They have a dark grayish brown fine sandy loam surface layer. The subsurface layer is yellowish brown fine sandy loam. The upper part of the subsoil is red silty clay. The middle part is yellowish red, mottled silty clay. The lower part is mottled gray and yellowish red silty clay loam.

Of minor extent in this map unit are Sumter and Kipling soils. The Sumter soils are well drained. They are on ridgetops and hillsides. The Kipling soils are somewhat poorly drained. They are on broad ridgetops and gently sloping hillsides.

The soils in this map unit are used mainly for commercial wood crops. A few small areas have been cleared and are used for pasture. Originally, most of the

acreage was in mixed hardwoods and pine. Slope is the main limitation to farming and most other uses.

Oktibbeha and Sacul soils are poorly suited to not suited to cultivated crops. Macon soils are moderately suited to not suited to cultivated crops. Oktibbeha and Sacul soils are moderately suited to pasture. Macon soils are well suited to pasture. Potential productivity is moderately high for commercial wood crops on the soils in this map unit.

Oktibbeha and Sacul soils are poorly suited to most urban uses. Slow and very slow permeability, wetness, slope, high shrink-swell potential, and low strength are the main limitations. Macon soils are moderately suited to most urban uses. Slow permeability, slope, moderate shrink-swell potential, and low strength are the main limitations.

6. Urbo-Marietta-Sardis

Deep, moderately well drained and somewhat poorly drained, level to nearly level, loamy soils that formed in alluvium

These soils are in the south-central part of the county on flood plains of streams that drain the Blackland Prairie. The largest area of these soils is on Terre Noir Creek.

This map unit makes up about 8 percent of Clark County. It is about 32 percent Urbo soils, 21 percent Marietta soils, 20 percent Sardis soils, and 27 percent soils of minor extent.

The somewhat poorly drained, level to nearly level Urbo soils are in the middle part of wide flood plains. They have a dark brown silty clay loam surface layer and a dark grayish brown silty clay subsurface layer. The upper part of the subsoil is grayish brown, mottled clay loam. The middle part is light brownish gray, mottled clay loam. The lower part is light brownish gray, mottled clay.

The moderately well drained, level Marietta soils are on the upper reaches of streams on narrow flood plains. They have a brown fine sandy loam surface layer and a yellowish brown fine sandy loam subsurface layer. The upper part of the subsoil is dark brown silty clay loam. The middle part is mottled dark brown, yellowish brown, and light brownish gray silty clay loam. The lower part is mottled light brownish gray and yellowish brown loam. The underlying material is mottled gray and dark yellowish brown clay loam and gray, mottled clay loam.

The somewhat poorly drained, level Sardis soils are on natural levees of the flood plains. They have a dark grayish brown silt loam surface layer. The upper part of the subsoil is yellowish brown, mottled silt loam. The middle part is yellowish brown, mottled silty clay loam. The lower part is mottled gray and yellowish brown silty clay loam. The underlying material is mottled gray and yellowish brown loam.

Of minor extent in this map unit are Terouge, Tuscumbia, Leeper, and Una soils.

Most of the soils in this map unit are used for cultivated crops. A few areas are used as pasture or hayland. The remaining acreage is mostly in bottom land hardwoods. Originally, most of the acreage was in bottom land hardwoods. Flooding and wetness are the main limitations to farming and most other uses.

The soils in this map unit are well suited to cultivated crops and to pasture. The potential productivity of these soils for commercial wood crops is very high.

These soils are poorly suited to most urban uses. Very slow permeability, flooding, and wetness are the main limitations of Urbo soils. Flooding and wetness are the main limitations of Marietta and Sardis soils.

7. Kipling-Wilcox-Houston

Deep, somewhat poorly drained and moderately well drained, nearly level to gently sloping, loamy and clayey soils that formed in residuum of weathered chalk or marl or in clayey shale

These soils are in the south-central part of the county. They are on broad ridgetops and on side slopes of the Blackland Prairie. The Kipling and Houston soils are underlain by marl and chalk. The Wilcox soils are underlain by acid clay shale.

This map unit makes up about 8 percent of Clark County. It is about 32 percent Kipling soils, 22 percent Wilcox soils, 14 percent Houston soils, and 32 percent soils of minor extent.

The somewhat poorly drained, level to gently sloping Kipling soils are on broad, upland ridgetops and side slopes. They have a dark grayish brown silt loam or silty clay loam surface layer and a brown silty clay loam subsurface layer. The upper part of the subsoil is mottled yellowish brown, light brownish gray, and yellowish red silty clay loam. The middle part is mottled light brownish gray, yellowish brown, and yellowish red clay. The lower part is mottled light brownish gray, olive yellow, yellowish brown, and yellowish red clay. The underlying material is mottled yellowish brown, grayish brown, and olive yellow clay.

The somewhat poorly drained, nearly level to gently sloping Wilcox soils are on broad uplands and side slopes. They have a dark grayish brown silt loam surface layer. The upper part of the subsoil is yellowish red, mottled clay. The middle part is mottled yellowish red, light brownish gray, and yellowish brown clay. The lower part is gray and light brownish gray, mottled silty clay. The underlying material is light brownish gray, mottled silty clay. Below that is light brownish gray clay shale.

The moderately well drained, nearly level to gently sloping Houston soils are on upland ridgetops and side slopes. They have a very dark gray clay surface layer and a dark olive gray clay subsurface layer. The underlying material is olive, yellowish brown, and light olive brown clay.

Of minor extent in this map unit are Sacul, Oktibbeha, Eutaw, and Mayhew soils. Sacul and Oktibbeha soils are in higher positions on the landscape. Eutaw and Mayhew soils are on broad upland flats.

The soils in this map unit are used mainly for pasture. In some areas, the nearly level soils are used for cultivated crops. Other areas are used for commercial wood crops. Originally, most of the acreage was in mixed handwoods and pines and in open savannas of prairie grasses. Slope is the main limitation for farming, and erosion is a severe hazard.

Houston soils are well suited to poorly suited to cultivated crops because of the slope. Kipling and Wilcox soils are moderately suited to poorly suited to cultivated crops because of the slope. These soils are well suited to pasture. The potential productivity of Kipling soils for commercial wood crops is high; for Wilcox soils, it is moderately high; and for Houston soils, it is moderate.

The soils in this map unit are poorly suited to most urban uses. Very slow permeability, wetness, low strength, and high shrink-swell potential are the main limitations.

8. Gurdon-Stough-Amy

Deep, poorly drained and somewhat poorly drained, level to nearly level, loamy soils that formed in old alluvium or in marine or fluvial sediment

These soils are on terraces of the Ouachita, Antoine, and Little Missouri Rivers and other major streams scattered throughout the county.

This map unit makes up about 12 percent of Clark County. It is about 46 percent Gurdon soils, 20 percent Stough soils, 13 percent Amy soils, and 21 percent soils of minor extent.

The somewhat poorly drained, level to nearly level Gurdon soils are on terraces. They have a dark grayish brown silt loam surface layer. The upper part of the subsoil is yellowish brown, mottled silt loam. The middle part is mottled yellowish brown and gray silt loam. The lower part is yellowish brown, mottled silt loam and silty clay loam.

The somewhat poorly drained, level to nearly level Stough soils are on terraces and upland flats. They have a dark grayish brown fine sandy loam surface layer and a grayish brown fine sandy loam subsurface layer. The upper part of the subsoil is mottled fine sandy loam. The middle part is mottled, compact and brittle loam. The lower part is mottled, compact and brittle sandy clay loam.

The poorly drained, level to nearly level Amy soils are on terraces. They have a grayish brown silt loam surface layer and a light brownish gray subsurface layer. The subsoil is gray, mottled silty clay loam.

Of minor extent in this map unit are Adaton, Guyton, Smithton, and Harleston soils. Adaton, Guyton, and Smithton soils are poorly drained. They are on terraces and in upland depressions. Harleston soils are moderately well drained. They are on microridges. Also included are Cahaba soils. These soils are well drained. They are on terraces.

The soils in this map unit are used mainly for commercial wood crops. A few areas have been cleared and are used for cultivated crops, pasture, or hay. Wetness is the main limitation to farming and most other uses.

Stough and Gurdon soils are well suited to cultivated crops. Amy soils are moderately suited to cultivated crops. These soils are well suited to pasture. Potential productivity is high for commercial wood crops on the soils in this map unit.

The soils in this map unit are poorly suited to most urban uses. Wetness and rare flooding are the main limitations.

9. Sardis-Guyton-Ouachita

Deep, well drained, somewhat poorly drained, and poorly drained, level to nearly level, loamy soils that formed in alluvium

These soils are on flood plains and terraces of the Ouachita, Little Missouri, and Antoine Rivers and other streams.

This map unit makes up about 16 percent of Clark County. It is about 36 percent Sardis soils, 24 percent Guyton soils, 11 percent Ouachita soils, and 29 percent soils of minor extent.

The somewhat poorly drained, level to nearly level Sardis soils are on flood plains and low terraces. They have a dark grayish brown silt loam surface layer. The upper part of the subsoil is yellowish brown, mottled silt loam. The middle part is yellowish brown, mottled silty clay loam. The lower part is mottled gray and yellowish brown silty clay loam. The underlying material is mottled gray and yellowish brown loam.

The poorly and very poorly drained, level Guyton soils are on flood plains. They have a grayish brown silt loam surface layer and a gray, mottled silt loam subsurface layer. The upper part of the subsoil is gray, mottled loam. The lower part is gray, mottled silt loam.

The well drained, level to nearly level Ouachita soils are on flood plains and low terraces. They have a dark grayish brown silt loam surface layer. The upper part of the subsoil is dark brown silty clay loam. The middle part is dark yellowish brown and yellowish brown, mottled silty clay loam. The lower part is dark yellowish brown, mottled silty clay loam.

Of minor extent in this map unit are Ochlockonee, Iuka, Nugent, and Ozan soils. The Ochlockonee soils are well drained, and the Iuka soils are moderately well drained. These soils are on natural levees. Nugent soils are excessively drained, and Ozan soils are poorly drained. These soils are on flood plains.

About one-third of the soils in this map unit are used for cultivated crops. The remaining acreage is used for

commercial wood crops. A few small areas are used for pasture or hay. Wetness and flooding are the main limitations to farming and most other uses.

Sardis and Ouachita soils are well suited to cultivated crops, and Guyton soils are poorly suited to cultivated crops. Sardis and Ouachita soils are well suited to pasture, and Guyton soils are moderately suited to pasture. The potential productivity of Sardis and Ouachita soils for commercial wood crops is very high, and for Guyton soils, it is high.

The soils in this map unit are poorly suited to most urban uses. Flooding and wetness are the main limitation.

Soil Descriptions for Hot Spring County

1. Bigfork-Yanush-Carnasaw

Moderately deep and deep, well drained, gently sloping to very steep, cherty and very cherty soils that formed in residuum or colluvium of interbedded, tilted and folded chert, novaculite, shale, and sandstone

These soils are in the western part of the county. They are on ridgetops and side slopes of the Ouachita Mountains.

This map unit makes up about 13 percent of Hot Spring County. It is about 29 percent Bigfork soils, 25 percent Yanush soils, 18 percent Carnasaw soils, and 28 percent soils of minor extent.

The moderately deep, very cherty, gently sloping to very steep Bigfork soils are on ridges and side slopes. They have a very dark grayish brown very cherty silt loam surface layer. The upper part of the subsoil is yellowish brown very cherty silty clay loam. The lower part is yellowish red very cherty silty clay loam. Below that is tilted and fractured, hard chert and novaculite bedrock.

The deep, gently sloping to steep Yanush soils are on side slopes and colluvial foot slopes. They have a dark brown very cherty silt loam surface layer. The subsurface layer is strong brown very cherty silt loam. The upper part of the subsoil is red very cherty silty clay loam. The lower part is red extremely cherty silty clay loam. Below that is massive chert and novaculite that has thin layers of shale and siltstone.

The deep, gently sloping to steep Carnasaw soils are on side slopes. They have a dark brown cherty silt loam surface layer. The upper part of the subsoil is yellowish red silty clay. The lower part is red silty clay. Below that is weakly cemented, acid shale that has thin layers of sandstone.

Of minor extent in this map unit are Ceda, Clebit, Pirum, Sherless and Zafra soils and Rock outcrop of massive chert and novaculite. The very cherty Ceda soils are on flood plains. Clebit, Pirum, Sherless, and Zafra soils are on moderately sloping to steep side slopes. The rock outcrop is on gently sloping ridgetops and very steep side slopes.

The soils in this map unit are used mainly as woodland. A few of the ridgetops and foot slopes have been cleared and are used for pasture. Slope, surface chert, and outcrops of rock are the main limitations to farming and most other uses.

Bigfork and Carnasaw soils are not suited to cultivated crops, and Yanush soils are poorly suited to not suited to cultivated crops because of the slope. Bigfork soils are not suited to improved pasture, and Carnasaw and Yanush soils are moderately suited to not suited to improved pasture because of the slope. The potential productivity of Bigfork soils for commercial wood crops is low; for Yanush soils, it is moderate; and for Carnasaw soils, it is moderately high.

Bigfork soils are poorly suited to most urban uses. Slope and depth to bedrock are the main limitations. Yanush soils are moderately suited to poorly suited to most urban uses. Slope, moderate permeability, and moderate shrink-swell potential are the main limitations. Carnasaw soils are poorly suited to most urban uses. Slope, slow permeability, and high shrink-swell potential are the main limitations.

2. Carnasaw-Zafra-Bismarck

Deep, moderately deep, and shallow, well drained and somewhat excessively drained, gently sloping to steep, gravelly, stony, and very shaly soils that formed in residuum of interbedded shale and sandstone or in tilted and fractured shale intruded with sandstone

These soils are in the western part of the county. They are on ridgetops, side slopes and valley floors of the Ouachita Mountains.

This map unit makes up about 24 percent of Hot Spring County. It is about 22 percent Carnasaw soils, 18 percent Zafra soils, 17 percent Bismarck soils, and 43 percent soils of minor extent.

The deep, well drained, gently sloping to steep Carnasaw soils are on steep side slopes and valley floors. They have a dark brown gravelly silt loam surface layer. The upper part of the subsoil is yellowish red silty clay. The lower part is red silty clay. Below that is weakly cemented, acid shale that has intrusions of sandstone.

The moderately deep to deep, well drained, gently sloping to steep Zafra soils are on steep side slopes. They have a dark grayish brown stony fine sandy loam surface layer and a yellowish brown very gravelly fine sandy loam subsurface layer. The upper part of the subsoil is yellowish brown very gravelly loam. The lower part is yellowish red very gravelly sandy clay loam. The underlying material is soft sandstone grading to hard sandstone.

The shallow, somewhat excessively drained, gently sloping to steep Bismarck soils are on valley floors and lower side slopes. They have a dark brown very shaly loam surface layer and brown very shaly loam subsurface layer. The subsoil is yellowish brown

extremely shaly loam. Below that is weakly cemented, acid shale.

Of minor extent in this map unit are Toine, Bonnerdale, Sherwood, Sherless, Pirum, Shermore, and Clebit soils. Toine soils are on flood plains. Bonnerdale soils are on concave foot slopes. Sherwood, Sherless, Pirum, and Shermore soils are on broad uplands. The moderately sloping to steep Clebit soils are on side slopes.

The soils in this map unit are used for pasture or hay or as woodland. Most of the gently sloping to moderately steep soils on valley floors have been cleared and are used for pasture or hay. The remaining acreage is in mixed pines and hardwoods. Slope, stones, and depth to bedrock are the main limitations to farming and most other uses.

Carnasaw soils are poorly suited to not suited to cultivated crops because of the slope. Zafra and Bismarck soils are not suited to cultivated crops. Carnasaw soils are moderately suited to not suited to improved pasture. Bismarck soils are poorly suited to not suited to improved pasture, and Zafra soils are not suited to improved pasture. Potential productivity of Carnasaw soils is moderately high for commercial wood crops; for Zafra soils, it is moderate; and for Bismarck soils, it is low.

Carnasaw, Zafra, and Bismarck soils are poorly suited to most urban uses. Slope, depth to bedrock, and slow permeability are the main limitations.

3. Magnet

Moderately deep and deep, well drained, gently sloping to steep, stony or loamy soils that formed in residuum of syenite and other intrusive igneous rocks

These soils are in the Magnet Cove area of the county. They are on side slopes and valley floors of a ring-dike complex.

This map unit makes up about 1 percent of Hot Spring County. It is about 95 percent Magnet soils and 5 percent soils of minor extent.

The gently sloping to steep Magnet soils are on valley floors and on side slopes. They have a dark reddish brown loam or stony loam surface layer and subsurface layer. The upper part of the subsoil is reddish brown clay or cobbly clay. The lower part is reddish brown clay loam or cobbly clay loam. The underlying material is soft, multicolored syenitic saprolite that has seams of reddish brown clay loam.

Of minor extent in this map unit are Carnasaw, Sherless, and Bismarck soils. These soils are dominantly on side slopes and foot slopes on the outer ring of the complex.

The soils in this map unit are used for pasture or as woodland. Most of the acreage was originally in mixed hardwoods. Slope, surface stones, and the low available water capacity are the main limitations to farming and most other uses.

Magnet soils are poorly suited to not suited to cultivated crops and moderately suited to not suited to pasture. The potential productivity of these soils for commercial wood crops is moderate.

The soils in this map unit are poorly suited to most urban uses. Depth to bedrock, slope, moderately slow permeability, and high shrink-swell potential are the main limitations.

4. Pirum-Bonnerdale-Sherless

Deep and moderately deep, well drained and somewhat poorly drained, level to gently sloping, loamy soils that formed in residuum of sandstone that has lenses of shale or in loamy sediment underlain by interbedded sandstone and shale

These soils are in the western part of the county. They are on upland ridges, foot slopes, and valley floors of the Ouachita Mountains.

This map unit makes up about 10 percent of Hot Spring County. It is about 30 percent Pirum soils, 27 percent Bonnerdale soils, 20 percent Sherless soils, and 23 percent soils of minor extent.

The moderately deep, well drained, gently sloping Pirum soils are on low ridgetops. They have a dark grayish brown fine sandy loam or gravelly fine sandy loam surface layer. The upper part of the subsoil is brownish yellow fine sandy loam. The lower part is yellowish brown loam. Below that is hard, tilted and fractured sandstone bedrock.

The deep, somewhat poorly drained, level to gently sloping Bonnerdale soils are on valley floors and concave upland foot slopes. They have a brown fine sandy loam surface layer. The upper part of the subsoil is yellowish brown, mottled fine sandy loam. The middle part is mottled strong brown and light brownish gray fine sandy loam. The lower part is mottled strong brown and light brownish gray loam. The underlying material is gray clay loam. Below that is weakly cemented, fractured, acid shale bedrock.

The moderately deep, well drained, gently sloping Sherless soils are on low ridgetops. They have a dark grayish brown fine sandy loam surface layer and a light yellowish brown fine sandy loam subsurface layer. The subsoil is yellowish red clay loam. Below that is soft, tilted and fractured sandstone bedrock.

Of minor extent in this map unit are Toine, Shermore, Carnasaw, Sherwood, Bismarck, Zafra, and Clebit soils. Toine soils are on flood plains. Shermore soils are on broad ridgetops. Carnasaw, Sherwood, and Bismarck soils are on side slopes and valley floors. The stony Zafra and Clebit soils are on narrow ridgetops.

The soils in this map unit are used mainly for pasture or as woodland. A few small areas are used for cultivated crops. Most of the acreage was originally in mixed upland hardwoods and pines. Slope, depth to

rock, and wetness are the main limitations to farming and most other uses.

Pirum soils are moderately suited to cultivated crops. Bonnerdale soils are well suited to cultivated crops. Sherless soils are moderately suited to poorly suited to cultivated crops. The soils in this map unit are well suited to pasture. The potential productivity of the soils in this map unit for commercial wood crops is moderately high.

Pirum and Sherless soils are moderately suited to most urban uses. Depth to bedrock is the main limitation of Pirum and Sherless soils. Bonnerdale soils are poorly suited to most urban uses. Wetness caused by the high water table is the main limitation.

5. Sacul-Bowie-Smithdale

Deep, moderately well drained and well drained, nearly level to moderately steep, loamy soils that formed in marine sediment

These soils are in the eastern part of the county. They are on ridgetops and side slopes of the Coastal Plain.

This map unit makes up about 11 percent of Hot Spring County. It is about 32 percent Sacul soils, 22 percent Bowie soils, 19 percent Smithdale soils, and 27 percent soils of minor extent.

The moderately well drained, gently sloping to moderately steep Sacul soils are on ridgetops and dissected side slopes. They have a dark grayish brown fine sandy loam surface layer and a yellowish brown fine sandy loam subsurface layer. The upper part of the subsoil is red silty clay. The middle part is yellowish red, mottled silty clay. The lower part is mottled gray and yellowish red silty clay loam.

The moderately well drained, nearly level to gently sloping Bowie soils are on hilltops and side slopes. They have a dark grayish brown fine sandy loam surface layer and a light yellowish brown fine sandy loam subsurface layer. The upper part of the subsoil is yellowish brown sandy clay loam. The lower part is yellowish brown, mottled sandy clay loam.

The well drained, nearly level to moderately steep Smithdale soils are on uniform side slopes. They have a brown fine sandy loam surface layer. The upper part of the subsoil is yellowish red sandy clay loam. The lower part is yellowish red sandy loam.

Of minor extent in this map unit are Harleston, Savannah, Pikeville, Ora, Ruston, Sawyer, and Saffell soils. Harleston soils are on terraces and upland flats. Savannah soils are on broad uplands. Pikeville, Ora, and Ruston soils are on ridgetops. Sawyer soils are on uniform side slope. Saffell soils are on ridgetops and side slopes.

The soils in this map unit are used mainly as woodland or for pasture. A few small areas are used for cultivated crops. Most of the acreage was originally in mixed hardwoods and pines. Slope and wetness are the main limitations to farming and most other uses, and erosion is a severe hazard.

Sacul soils are poorly suited to cultivated crops, and Bowie and Smithdale soils are moderately suited to cultivated crops. Sacul soils are moderately suited to pasture, and Bowie and Smithdale soils are well suited to pasture. The potential productivity of the soils in this map unit for commercial wood crops is moderately high.

Sacul soils are poorly suited to most urban uses. Slow permeability, slope, wetness, low strength, and high shrink-swell potential are the main limitations. Bowie soils are moderately suited to most urban uses. Moderate permeability, slope, and wetness are the main limitations. Smithdale soils are well suited to most urban uses. The only limitations of the Smithdale soils are moderate permeability and slope.

6. Saffell-Sacul-Pikeville

Deep, well drained and moderately well drained, nearly level to moderately steep, gravelly or loamy soils that formed in marine sediment

These soils are in the southeastern part of the county. They are on ridgetops and side slopes of the Coastal Plain.

This map unit makes up about 23 percent of Hot Spring County. It is about 33 percent Saffell soils, 22 percent Sacul soils, 15 percent Pikeville soils, and 30 percent soils of minor extent.

The well drained, gently sloping to moderately steep Saffell soils are on hilltops and upper side slopes. They have a dark grayish brown gravelly fine sandy loam surface layer. The upper part of the subsoil is yellowish brown gravelly fine sandy loam. The lower part is yellowish red very gravelly sandy clay loam. Below that is reddish yellow extremely gravelly sandy loam.

The moderately well drained, gently sloping to moderately steep Sacul soils are on side slopes. They have a dark grayish brown fine sandy loam surface layer and a yellowish brown fine sandy loam subsurface layer. The upper part of the subsoil is red silty clay. The middle part is yellowish red, mottled silty clay. The lower part is mottled gray and yellowish red silty clay loam.

The well drained, nearly level to gently sloping Pikeville soils are on broad hilltops. They have a dark brown fine sandy loam surface layer. The upper part of the subsoil is yellowish red loam. The middle part is red gravelly loam. The lower part is red extremely gravelly loam.

Of minor extent in this map unit are Bowie, Ora, and Savannah soils. These soils are on hilltops and upper side slopes.

The soils in this map unit are used mainly as woodland or for pasture. A few small areas are used for cultivated crops. Most of the acreage was originally in mixed hardwoods and pines. Slope and wetness are the main limitations to farming and most other uses, and erosion is a severe hazard.

Saffell soils are moderately suited to not suited to cultivated crops. Sacul soils are poorly suited to not suited to cultivated crops. Pikeville soils are moderately suited to cultivated crops. Saffell and Sacul soils are moderately suited to pasture, and Pikeville soils are well suited to pasture. The potential productivity of the Sacul and Pikeville soils for commercial wood crops is moderately high, and for Saffell soils, it is moderate.

Saffell soils are well suited to most urban uses. Slope and moderate permeability are the only limitations. Sacul soils are poorly suited to most urban uses. Slow permeability, slope, wetness, and high shrink-swell potential are the main limitations. Pikeville soils are well suited to most urban uses. They have no significant limitations.

7. Sardis-Ouachita-Kirkville

Deep, somewhat poorly drained to well drained, level to nearly level, loamy soils that formed in alluvium

These soils are in the eastern part of the county. They are on flood plains and terraces of the Ouachita River and other streams.

This map unit makes up about 6 percent of Hot Spring County. It is about 30 percent Sardis soils, 25 percent Ouachita soils, 22 percent Kirkville soils, and 23 percent soils of minor extent.

The somewhat poorly drained, level to nearly level Sardis soils are on flood plains and low terraces. They have a dark grayish brown silt loam surface layer. The upper part of the subsoil is yellowish brown, mottled silt loam. The middle part is yellowish brown, mottled silty clay loam. The lower part is mottled gray and yellowish brown silty clay loam. The underlying material is mottled gray and yellowish brown loam.

The well drained, level to nearly level Ouachita soils are on flood plains and low terraces. They have a dark grayish brown silt loam surface layer. The upper part of the subsoil is dark brown silty clay loam. The middle part is dark yellowish brown and yellowish brown, mottled silty clay loam. The lower part is dark yellowish brown, mottled silty clay loam.

The moderately well drained, level Kirkville soils are on flood plains. They have a dark grayish brown fine sandy loam surface layer. The upper part of the subsoil is yellowish brown, mottled fine sandy loam. The lower part is light brownish gray, mottled fine sandy loam. The underlying material is mottled sandy loam.

Of minor extent in this map unit are Ochlockonee, Iuka, Nugent, and Ozan soils. Ochlockonee soils are well drained, and Iuka soils are moderately well drained. These soils are on natural levees. Nugent soils are excessively drained, and Ozan soils are poorly drained. These soils are on flood plains.

About one-third of the soils in this map unit are used for cultivated crops. The remaining acreage is used for commercial wood crops. A few small areas are used for pasture and hay. Wetness and flooding are the main limitations to farming and most other uses.

The soils in this map unit are well suited to cultivated crops and to pasture. Potential productivity of these soils is very high for commercial wood crops.

These soils are poorly suited to urban use. Flooding is the main limitation.

8. Stough-Gurdon-Harleston

Deep, somewhat poorly drained and moderately well drained, level to nearly level, loamy soils that formed in old alluvium or in marine or fluvial sediment

These soils are in the eastern part of the county. They are on terraces of the major streams and on upland flats.

This map unit makes up about 12 percent of Hot Spring County. It is about 38 percent Stough soils, 20 percent Gurdon soils, 16 percent Harleston soils, and 26 percent soils of minor extent.

The somewhat poorly drained Stough soils are on terraces and upland flats. They have a dark grayish brown fine sandy loam surface layer and a grayish brown fine sandy loam subsurface layer. The upper part of the subsoil is mottled fine sandy loam. The middle part is mottled, compact and brittle loam. The lower part is mottled, compact and brittle sandy clay loam.

The somewhat poorly drained Gurdon soils are on terraces. They have a dark grayish brown silt loam surface layer. The upper part of the subsoil is yellowish brown, mottled silt loam. The middle part is mottled yellowish brown and gray silt loam and silty clay loam.

The moderately well drained Harleston soils are on terraces and upland flats. They have a dark brown fine sandy loam surface layer and a yellowish brown fine sandy loam subsurface layer. The upper part of the subsoil is light yellowish brown sandy loam. The middle part is yellowish brown, mottled sandy clay loam. The lower part is mottled sandy clay loam.

Of minor extent in this map unit are the poorly drained Adaton, Amy, and Smithton soils. These soils are poorly drained. They are in depressions and on terraces and broad flats.

The soils in this map unit are mainly used for commercial wood crops. A few areas have been cleared and are used for cultivated crops, pasture, or hay. Wetness is the main limitation to farming and most other uses.

The soils in this map unit are well suited to cultivated crops and to pasture. Potential productivity of these soils is high for commercial wood crops.

These soils are poorly suited to most urban uses. Wetness and rare flooding are the main limitations.

Detailed Soil Map Units

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

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil 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 or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Sacul fine sandy loam, 3 to 8 percent slopes, is one of several phases in the Sacul series.

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

A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Carnasaw-Bismarck-Sherless complex, 3 to 8 percent slopes, is an example.

A *soil association* is made up of two or more geographically associated soils that are shown as one unit on the maps. Because of present or anticipated soil uses in the survey area, it was not considered practical or necessary to map the soils separately. The pattern and relative proportion of the soils are somewhat similar. Sacul-Smithdale association, rolling, is an example.

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

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

Table 6 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

1—Adaton silt loam, 0 to 1 percent slopes. This deep, poorly drained, level soil is on stream terraces in the Coastal Plain. This soil is rarely flooded. Areas of this soil are long and wide. They parallel the flood plain. The individual areas are about 30 to 100 acres.

Typically, the surface layer is dark grayish brown, mottled silt loam about 4 inches thick. The subsoil is light brownish gray, mottled silty clay loam to a depth of about 30 inches; gray, mottled silty clay loam to a depth of about 58 inches; and gray, mottled silty clay to a depth of 72 inches.

This soil is moderate in natural fertility and low to moderate in organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability is slow, and the available water capacity is high. A seasonal high water table is within a depth of 6 inches from January through April. This soil has good tilth; however, wetness often delays tillage operations. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots. Water from rainfall often ponds on the surface of this soil for short periods during the winter and early in the spring.

Included with this soil in mapping are small areas of Amy and Gurdon soils. Also, included are a few sandy

areas. These areas occur as mounds that are about 8 feet high and about 50 feet across.

This Adaton soil is moderately suited to cultivated crops. Suitable crops include rice, grain sorghum, small grains, and soybeans. Wetness and a seasonal high water table are the main limitations. Tillage operations are often delayed for several days after a rain if an adequate drainage system is not installed. Erosion is a slight hazard if this soil is used for cultivated crops. If management practices that include minimum tillage and drainage are used, crops that leave a large amount of residue can be grown year after year. Crops that leave a large amount of surface residue reduce surface crusting, increase organic matter, and improve tilth.

This soil is moderately suited to improved pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, bahiagrass, and lespedeza. Wetness restricts the use of some farm equipment and limits grazing in the winter and early in the spring. Grazing when the soil is saturated causes sod damage and surface compaction. Other management concerns include deferred grazing, rotation grazing, and weed control.

This soil mainly is used as woodland. Potential productivity is high for commercial wood crops. Suitable trees include loblolly pine, Shumard oak, and sweetgum. Because of wetness, seedling mortality is a moderate limitation to woodland use and management, and the restricted use of equipment is a severe limitation. Seedling mortality can be partly overcome by planting on a raised seedbed. Logging operations that require the use of heavy equipment must be confined to the summer and the fall.

This soil is poorly suited to most urban uses. Slow permeability and wetness are severe limitations for septic tank absorption fields. These limitations are difficult and often impractical to overcome. They can be partly alleviated by increasing the size of the absorption field and installing a subsurface drainage system around the perimeter.

Rare flooding and wetness are severe limitations for dwellings and small commercial buildings. Major flood control structures are necessary to overcome the flooding limitation. Surface diversions and a subsurface drainage system can partly alleviate the wetness limitation.

Wetness is a severe limitation for local roads and streets. Constructing roads and streets on raised suitable subgrade fill material helps to alleviate these limitations.

This Adaton soil is in capability subclass IIIw and in woodland suitability group 2w9.

2—Amy silt loam, 0 to 2 percent slopes. This deep, poorly drained, level to nearly level soil is on stream terraces in the Coastal Plain. This soil is rarely flooded. Areas of this soils are long and wide. They parallel the flood plain. The individual areas are about 20 to 100 acres.

Typically, the surface layer is grayish brown silt loam about 6 inches thick. The subsurface layer is light brownish gray, mottled silt loam to a depth of about 21 inches. The subsoil is gray, mottled silty clay loam to a depth of 72 inches.

This soil is low in natural fertility and organic matter content. Reaction ranges from strongly acid to extremely acid throughout. Permeability is slow, and the available water capacity is high. A seasonal high water table is within a depth of 12 inches from December through April. This soil has good tilth; however, wetness often delays tillage operations. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots. Water from rainfall often ponds on the surface of this soil for short periods during the winter and early in the spring.

Included with this soil in mapping are small areas of Adaton and Gurdon soils. Also, included are a few sandy areas. These areas occur as mounds that are about 7 feet high and about 40 feet across.

This Amy soil is moderately suited to cultivated crops. Suitable crops include rice, grain sorghum, small grains, and soybeans. Wetness and a seasonal high water table are the main limitations. Tillage operations are often delayed for several days after a rain if an adequate drainage system is not installed. Erosion is a slight hazard if this soil is used for cultivated crops. If management practices that include minimum tillage and drainage are used, crops that leave a large amount of residue on the surface can be grown year after year. Crops that leave a large amount of surface residue reduce surface crusting, increase organic matter, and improve tilth.

This soil is moderately suited to improved pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, bahiagrass, and lespedeza. Wetness restricts the use of some farm equipment and limits grazing in the winter and early in the spring. Grazing when the soil is saturated causes sod damage and surface compaction. Other concerns in management include deferred grazing, rotation grazing, and weed control.

This soil mainly is used for woodland. Potential productivity is high for commercial wood crops. Suitable trees include loblolly pine and sweetgum. Because of wetness, seedling mortality is a moderate limitation to woodland use and management, and the restricted use of equipment is a severe limitation. Seedling mortality can be partly overcome by planting on a raised seedbed. Logging operations that require the use of heavy equipment should be confined to the summer and the fall.

This soil is poorly suited to most urban uses. Slow permeability and wetness are severe limitations for septic tank absorption fields. These limitations are

difficult and often impractical to overcome. They can be partly alleviated by increasing the size of the absorption field and installing a subsurface drainage system around the perimeter.

Rare flooding and wetness are severe limitations for dwellings and small commercial buildings. Major flood control structures are necessary to overcome the flooding limitation. Surface diversions and a subsurface drainage system can partly alleviate the wetness limitation.

Wetness and low strength are severe limitations for local roads and street. Constructing roads and streets on raised suitable subgrade fill material helps to alleviate these limitations.

This Amy soil is in capability subclass IIIw and in woodland suitability group 2w9.

3—Avilla fine sandy loam, 3 to 8 percent slopes. This deep, well drained, gently sloping soil is on stream terraces in the Ouachita Mountains. This soil is rarely flooded. Areas of this soil are long and narrow. They parallel the flood plain. The individual areas are about 10 to 50 acres.

Typically, the surface layer is brown fine sandy loam about 3 inches thick. The subsurface layer is yellowish brown fine sandy loam to a depth of about 10 inches. The subsoil is strong brown loam to a depth of about 23 inches; yellowish red sandy clay loam to a depth of about 41 inches; and yellowish red, mottled sandy clay loam to a depth of 72 inches.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability is moderate, and the available water capacity is high. Crops respond well to fertilization. This soil has good tilth and can be tilled throughout a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Shermore and Sherwood soils. Also included are a few small areas of soils that have slopes of less than 3 percent and more than 8 percent.

This Avilla soil is moderately suited to cultivated crop. Suitable crops include grain sorghum, small grains, and soybeans. If this soil is used for cultivated crops, erosion is a moderate to severe hazard. If management practices that include minimum tillage, contour farming, crop rotation, and terracing of the steeper slopes are used, crops that leave a large amount of residue on the surface can be grown year after year. As slope length and gradient increase, conservation treatment should be intensified.

This soil is well suited to improved pasture or hay crops. Suitable pasture plants are bermudagrass, bahiagrass, white clover, red clover, and lespedeza. Concerns in management include deferred grazing and weed and brush control.

This soil mainly is used as woodland. Potential productivity is moderately high for commercial wood crops. Suitable trees include shortleaf pine, loblolly pine, black walnut, and cherrybark oak. Avilla soil has no significant limitations to woodland use and management.

This soil is moderately suited to most urban uses. Moderate permeability and rare flooding are moderate limitations for septic tank absorption fields. The permeability limitation can be minimized by increasing the size of the absorption field.

Flooding is a severe limitation for dwellings and small commercial buildings and a moderate limitation for local roads and streets. Major flood control structures are needed to overcome this limitation.

This Avilla soil is in capability subclass IIIe and in woodland suitability group 3o7.

4—Bigfork-Rock outcrop complex, 3 to 8 percent slopes. This map unit consists of moderately deep, well drained, very cherty, gently sloping soil and Rock outcrop on ridgetops (fig. 1) in the Ouachita Mountains. Areas of the soil and Rock outcrop are so intricately mixed or so small that it was not practical to separate them at the scale selected for mapping. Mapped areas range from about 25 to 200 acres. The individual areas are about 1 to 5 acres.

Bigfork soil makes up about 45 percent of the map unit. Typically, the surface layer is very dark grayish brown very cherty silt loam about 5 inches thick. The subsoil is yellowish brown very cherty silty clay loam to a depth of about 12 inches and yellowish red very cherty silty clay loam to a depth of about 26 inches. Below that is tilted and fractured chert and novaculite bedrock that has thin strata of shale and sandstone.

Bigfork soil is low in natural fertility and organic matter content. Reaction ranges from slightly acid to strongly acid in the surface layer and ranges from medium acid to very strongly acid in the subsoil. Permeability is moderate, and the available water capacity is low. The root zone is moderately deep, but the high chert content restricts root penetration.

Rock outcrop makes up about 30 percent of the map unit. Typically, the outcrops of chert and novaculite range from about 3 feet to about 20 feet across and from a few inches above the surface layer to as much as 15 feet in height.

Included in mapping are small areas of Carnasaw and Yanush soils. Also included are soils that are similar to Bigfork soil but have a higher clay content and also a few areas of soils that are more shallow to bedrock. The included soils make up 25 percent of this map unit.

The Bigfork soil in this map unit is not suited to cultivated crops or improved pasture because of the high content of chert, depth to bedrock, and intermingled rock outcrops. Erosion is a very high hazard. The soils are best suited to use as woodland, habitat for wildlife, and

Figure 1.—Potential productivity for commercial wood crops is low for Bigfork-Rock outcrop complex, 3 to 8 percent slopes. Low grade hardwoods are the dominant vegetation on this ridgetop.

recreation. They should not be cleared of their native vegetation.

The soils in this map unit mainly are used as woodland. Potential productivity is low for commercial wood crops. Suitable trees include shortleaf pine and loblolly pine. Seedling mortality is a moderate limitation to woodland use and management. Rock outcrop severely restricts the use of equipment for woodland use and management.

The soils in this map unit are poorly suited to most urban uses. Depth to bedrock on Bigfork soil and rock outcrop are severe limitations for septic tank absorption fields. Depth to bedrock is a moderate limitation for dwellings and small commercial buildings and for local roads and streets. Depth to bedrock limitations are difficult and generally impractical to overcome. Slope is a moderate limitation for small commercial buildings. The slope limitation can be minimized by designing the buildings to conform to the natural contour of the land.

This Bigfork soil is in capability subclass VIe and in woodland suitability group 5fd. Rock outcrop is in capability subclass VIIIs.

5—Bigfork-Rock outcrop complex, 40 to 60 percent slopes. This map unit consists of moderately deep, well drained, very cherty, very steep soil and areas of Rock outcrop on side slopes in the Ouachita Mountains. Mapped areas range from about 100 to more than 1,000 acres. The individual areas are about 3 to 5 acres.

Bigfork soil makes up about 45 percent of the map unit. Typically, the surface layer is very dark grayish brown very cherty silt loam about 5 inches thick. The subsoil is yellowish brown very cherty silty clay loam to a depth of about 12 inches and yellowish red very cherty silty clay loam to a depth of about 26 inches. Below that is tilted and fractured chert and novaculite bedrock that has lenses of shale and sandstone.

Bigfork soil is low in natural fertility and organic matter content. Reaction ranges from slightly acid to strongly acid in the surface layer and ranges from medium acid to very strongly acid in the subsoil. Permeability is moderate, and the available water capacity is low. The root zone is moderately deep, but the high chert content restricts root penetration.

Rock outcrop makes up about 25 percent of this complex. This Rock outcrop is chert and novaculite and ranges from about 2 feet to more than 20 feet in diameter, and rise to more than 10 feet above the soil surface (fig. 2).

Included in mapping are some small areas of Yanush and Carnasaw soils. Also included are soils that are similar to Bigfork soil except they are deeper or more shallow to bedrock, and they contain more clay. The included soils make up 30 percent of this map unit.

The Bigfork soil in this map unit is not suited to cultivated crops or improved pasture because of very steep slopes, very rapid runoff, and depth to bedrock. Erosion is a very high hazard. Intermingled rock outcrops are the main limitation for these uses. These soils are best suited to woodland, habitat for wildlife, and recreation. They should not be cleared of their native vegetation.

The soils in this map unit mainly are used for woodland. Potential productivity is low for commercial wood crops. Suitable trees include shortleaf pine. Seedling mortality is a moderate limitation to woodland use and management, and restricted use of equipment is a severe limitation. Erosion is a severe hazard.

The soils in this map unit are poorly suited to most urban uses. Slope and depth to bedrock are severe limitations to use of Bigfork soil as septic tank absorption fields, as sites for dwellings and small commercial buildings, and for local roads and streets. It is generally impractical and difficult to overcome these limitations.

This Bigfork soil is in capability subclass VIIe and in woodland suitability group 5f9. Rock outcrop is in capability subclass VIIIs.

6—Bismarck very shaly loam, 3 to 12 percent slopes. This shallow, somewhat excessively drained,

Figure 2.—Outcrop of novaculite in Bigfork-Rock outcrop complex, 40 to 60 percent slopes. Commercial timber production is low in this map unit.

gently sloping to moderately sloping soil is on the lower side slopes and on valley floors of the Ouachita Mountains. The slopes are smooth and convex. The individual areas are about 20 to 50 acres.

Typically, the surface layer is dark brown very shaly loam about 3 inches thick. The subsurface layer is brown very shaly loam to a depth of about 7 inches. The subsoil is yellowish brown extremely shaly loam to a depth of about 14 inches. Below that is very dark gray, brown, and red, weakly cemented, fractured, acid shale bedrock.

This soil is low in natural fertility and organic matter content. Reaction ranges from medium acid to very strongly acid throughout. Permeability is moderate, and the available water capacity is very low. Pastures respond moderately well to fertilization. Shale fragments impede tillage. The root zone is shallow.

Included with this soil in mapping are a few small areas of Carnasaw and Sherless soils. Also included are a few small areas of soils that have slopes of less than 3 percent.

This Bismarck soil is not suited to cultivated crops. Because of the depth to bedrock and the high content of shale fragments, this soil has a very low available water capacity. Erosion is a very severe hazard if this soil is used for cultivated crops, and the high content of shale fragments impedes tillage operations.

This soil is poorly suited to pasture. It is droughty because of the depth to bedrock and the high content of shale fragments. Suitable pasture plants are bermudagrass, bahiagrass, and lespedeza. Concerns in management include weed and brush control and deferred grazing.

Potential productivity is low for commercial wood crops. Suitable trees include eastern redcedar, loblolly pine, and shortleaf pine. Seedling mortality is a moderate limitation to woodland use and management.

This soil is poorly suited to most urban uses. Depth to bedrock is a severe limitation to use as septic tank absorption fields and is a moderate limitation to use as sites for dwellings and small commercial buildings and for local roads and streets. Slope is also a moderate limitation for small commercial buildings. These limitations are difficult and often impractical to overcome. An alternate site should be selected in most cases.

This Bismarck soil is in capability subclass VIe and in woodland suitability group 5d8.

7—Bismarck very shaly loam, 12 to 20 percent slopes. This shallow, somewhat excessively drained, moderately sloping to moderately steep soil is on the lower side slopes and on valley floors of the Ouachita Mountains. The slopes are smooth and convex. The individual areas are about 1 to 50 acres.

Typically, the surface layer is dark brown very shaly loam about 3 inches thick. The subsurface layer is brown very shaly loam to a depth of about 7 inches. The subsoil is yellowish brown extremely shaly loam to a depth of about 14 inches. Below that is a very dark gray, brown, and red, weakly cemented, fractured, acid shale bedrock.

This soil is low in natural fertility and organic matter content. Reaction ranges from medium acid to very strongly acid throughout. Permeability is moderate, and the available water capacity is very low. Pastures respond moderately well to fertilization. Shale fragments impede tillage. The root zone is shallow.

Included with this soil in mapping are a few small areas of Carnasaw and Sherless soils. Also included are a few small areas of soils that have slopes of more than 20 percent.

This Bismarck soil is not suited to cultivated crops. Because of the depth to bedrock and the high content of shale fragments, this soil has a very low available water capacity. Erosion is a very severe hazard if this soil is used for cultivated crops, and the high content of shale fragments impedes tillage operations.

This soil is poorly suited to pasture. It is droughty because of the depth to bedrock and the high content of shale fragments. Suitable pasture plants are bermudagrass, bahiagrass, and lespedeza. Concerns in management include weed and brush control and deferred grazing.

Potential productivity is low for commercial wood crops. Suitable trees include eastern redcedar, shortleaf pine, and loblolly pine. Seedling mortality and restricted use of equipment are moderate limitations to woodland use and management. Erosion is a moderate hazard.

This soil is poorly suited to most urban uses. Depth to bedrock and slope are severe limitations for septic tank absorption fields. These limitations are difficult and generally impractical to overcome. An alternate site should be selected in most cases.

Slope is a severe limitation for dwellings and small commercial buildings and for local roads and streets. Designing dwellings and small commercial buildings to conform to the natural contour of the land can help offset this limitation. Constructing roads and streets on the contour helps minimize the slope limitation. An alternate site should be selected for these urban uses.

This Bismarck soil is in capability subclass VIe and in woodland suitability group 5d8.

8—Bonnerdale fine sandy loam, 0 to 5 percent slopes. This deep, somewhat poorly drained, level to gently sloping soil is on slightly concave uplands and in valleys. The slopes are smooth to slightly concave. The individual areas are about 10 to 100 acres.

Typically, the surface layer is brown fine sandy loam about 5 inches thick. The subsurface layer is yellowish brown, mottled fine sandy loam to a depth of about 19 inches. The subsoil is yellowish brown, mottled loam to a depth of about 34 inches; mottled strong brown and light brownish gray fine sandy loam to a depth of about 45

inches; mottled strong brown and light brownish gray loam to a depth of about 54 inches. The substratum is gray clay loam to a depth of 59 inches. The underlying material is very dark gray and brown, weakly cemented shale bedrock that has lenses of clay to a depth of 75 inches.

This soil is low in natural fertility and low to moderate in organic matter content. Reaction ranges from strongly acid to extremely acid throughout. Permeability is moderate, and the available water capacity is moderate. A seasonal high water table is within a depth of 6 inches from December through May. Crops respond well to fertilization. This soil has moderately good tilth, but wetness often delays tillage operations. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Foley and Pirum soils. Also included are a few sandy areas that occur as mounds.

This Bonnerdale soil is well suited to cultivated crops. Suitable crops include soybeans, grain sorghum, and small grains. Runoff is slow or medium. Erosion is a moderate hazard if this soil is used for cultivated crops. If management practices that include minimum tillage and contour farming are used, crops that leave a large amount of residue on the surface can be grown year after year. Crops that leave a large amount of surface residue reduce surface crusting, increase organic matter, and improve tilth. As slope length and gradient increase, conservation treatment should be intensified.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

This soil mainly is used as woodland. Potential productivity is moderately high for commercial wood crops. Suitable trees include loblolly pine and shortleaf pine. Wetness is a moderate limitation to use of equipment on this soil. This limitation is difficult or impractical to overcome but can be minimized by planting and harvesting during the dry periods.

This soil is poorly suited to most urban uses. Wetness is a severe limitation for septic tank absorption fields. This limitation is difficult to overcome. It can be partly alleviated by installing a subsurface drainage system around the perimeter.

Wetness is a severe limitation for dwellings and small commercial buildings and for local roads and streets. Installing diversions and drainage systems can partly alleviate the wetness limitation for dwellings and commercial buildings. Constructing roads and streets on raised suitable subgrade fill material helps to alleviate the limitation for roads and streets.

This Bonnerdale soil is in capability subclass IIe and in woodland suitability group 3w8.

9—Bowie fine sandy loam, 1 to 3 percent slopes. This deep, moderately well drained, nearly level soil is on broad hilltops in the Coastal Plain. The slopes are smooth and convex. The individual areas are about 10 to 50 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 6 inches thick. The subsurface layer is light yellowish brown fine sandy loam to a depth of about 17 inches. The subsoil is yellowish brown sandy clay loam to a depth of about 32 inches and yellowish brown, mottled sandy clay loam to a depth of 72 inches.

This soil is low in natural fertility and organic matter content. Reaction ranges from slightly acid to strongly acid in the surface layer and is strongly acid or very strongly acid in the subsoil. Permeability is moderately slow, and the available water capacity is moderate. A seasonal high water table is within a depth of 36 inches from December through March. This soil has good tilth and can be tilled throughout a wide range of moisture content. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Savannah, Ora, and Sacul soils.

This Bowie soil is well suited to cultivated crops. Suitable crops include grain sorghum and small grains. Runoff is medium. Erosion is a moderate hazard if this soil is used for cultivated crops. If management practices that include minimum tillage, contour farming, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year. As slope length and gradient increase, conservation treatment should be intensified.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

This Bowie soil mainly is used as woodland. Potential productivity is moderately high for commercial wood crops. Suitable trees include loblolly pine and shortleaf pine. This soil has no significant limitations to woodland use and management.

This soil is moderately suited to most urban uses. Moderately slow permeability and wetness are severe limitations for septic tank absorption fields. These limitations can be minimized by increasing the size of the absorption field, installing a drainage system around the perimeter, or using a specially designed alternate system.

This soil has no significant limitations to use for dwellings and small commercial buildings and for local roads and streets.

This Bowie soil is in capability subclass IIe and in woodland suitability group 3o7.

10—Bowie fine sandy loam, 3 to 8 percent slopes. This deep, moderately well drained, gently sloping soil is

on hilltops and side slopes in the Coastal Plain. The slopes are smooth and convex. The individual areas are about 5 to 50 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 6 inches thick. The subsurface layer is light yellowish brown fine sandy loam to a depth of about 17 inches. The subsoil is yellowish brown sandy clay loam to a depth of about 32 inches and yellowish brown, mottled sandy clay loam to a depth of 72 inches.

This soil is low in natural fertility and organic matter content. Reaction ranges from slightly acid to strongly acid in the surface layer and is strongly acid or very strongly acid in the subsoil. Permeability is moderately slow, and the available water capacity is moderate. A seasonal high water table is within a depth of 36 inches from December through March. This soil has good tilth and can be tilled throughout a wide range of moisture content. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Savannah, Ora, and Sacul soils.

This Bowie soil is moderately suited to cultivated crops. Suitable crops include grain sorghum and small grains. Runoff is medium or rapid. Erosion is a severe hazard if this soil is used for cultivated crops. If management practices that include minimum tillage, contour farming, terracing, and crop rotation are used, crops that leave a large amount of residue of the surface can be grown year after year. As slope length and gradient increase, conservation treatment should be intensified.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include deferred grazing and weed and brush control.

This Bowie soil mainly is used as woodland. Potential productivity is moderately high for commercial wood crops. Suitable trees include loblolly pine and shortleaf pine. This soil has no significant limitations to woodland use and management.

This soil is moderately suited to most urban uses. Moderately slow permeability and wetness are severe limitations for septic tank absorption field. These limitations can be minimized by increasing the size of the absorption field, installing a drainage system around the perimeter, or using a specially designed alternate system.

This soil has no significant limitations for dwellings and for local roads and streets. Slope is a moderate limitation for small commercial buildings, but by designing buildings to conform to the natural contour of the land can minimize this limitation.

This Bowie soil is in capability subclass IIIe and in woodland suitability group 3o7.

11—Cahaba fine sandy loam, 1 to 3 percent slopes. This deep, well drained, nearly level soil is on stream terraces in the Coastal Plain. This soil is rarely flooded. The slopes are smooth and convex. The individual areas are about 10 to 40 acres.

Typically, the surface layer is brown fine sandy loam about 5 inches thick. The subsurface layer is yellowish brown fine sandy loam to a depth of about 9 inches. The subsoil is yellowish red sandy clay loam to a depth of about 41 inches. The underlying material is yellowish brown sandy loam to a depth of 72 inches.

This soil is moderate in natural fertility and low in organic matter content. Reaction ranges from medium acid to very strongly acid throughout. Permeability is moderate, and the available water capacity is moderate. This soil has good tilth and can be tilled throughout a wide range of moisture content. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Gurdon and Stough soils. Also included are a few small areas of soils that have slopes of more than 3 percent.

This Cahaba soil is well suited to cultivated crops. Suitable crops include soybeans, grain sorghum, small grains, and vegetable crops. Runoff is medium. Erosion is a moderate hazard if this soil is used for cultivated crops. If management practices that include minimum tillage, contour farming, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year.

As slope length and gradient increase, conservation treatment should be intensified.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include deferred grazing and weed and brush control.

This soil mainly is used as woodland. Potential productivity is high for commercial wood crops. Suitable trees include loblolly pine, sweetgum, and American sycamore. Cahaba soil has no significant limitations to woodland use and management.

This soil is poorly suited to most urban uses. Rare flooding is a moderate limitation for septic tank absorption field. Flooding is a severe limitation for dwellings and small commercial buildings and a moderate limitation for local roads and streets. Major flood control structures are needed to overcome this limitation.

This Cahaba soil is in capability subclass IIe and in woodland suitability group 2o7.

12—Cahaba fine sandy loam, 3 to 6 percent slopes. This deep, well drained, gently sloping soil is on stream terraces in the Coastal Plain. This soil is rarely

flooded. The slopes are smooth and convex. The individual areas are about 5 to 30 acres.

Typically, the surface layer is brown fine sandy loam about 5 inches thick. The subsurface layer is yellowish brown fine sandy loam to a depth of about 9 inches. The subsoil is yellowish red sandy clay loam to a depth of about 41 inches. The underlying material is yellowish brown sandy loam to a depth of 72 inches.

This soil is moderate in natural fertility and low in organic matter content. Reaction ranges from medium acid to very strongly acid throughout. Permeability is moderate, and the available water capacity is moderate. This soil has good tilth and can be tilled throughout a wide range of moisture content. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Gurdon, Stough, and Savannah soils. Also included are soils similar to Cahaba soil but have a gravelly subsoil and also a few small areas of soils that have slopes of more than 6 percent.

This Cahaba soil is well suited to cultivated crops. Suitable crops include soybeans, milo, small grains, and vegetable crops. Runoff is medium or rapid. Erosion is a moderate to severe hazard if this soil is used for cultivated crops. If management practices that include minimum tillage, contour farming, terracing of the steeper slopes, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year. As slope length and gradient increase, conservation treatment should be intensified.

This soil is well suited to pasture or hay crops (fig. 3). Suitable pasture plants include tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and brush control.

This soil mainly is used as woodland. Potential productivity is high for commercial wood crops. Suitable trees include loblolly pine, sweetgum, and American sycamore. Cahaba soil has no significant limitations to woodland use and management.

This soil is poorly suited to most urban uses. Rare flooding is a moderate limitation for septic tank absorption fields. Flooding is a severe limitation for dwellings and commercial buildings and a moderate

Figure 3.—Cahaba fine sandy loam, 3 to 6 percent slopes, is well suited to hayland. Large bales are used to reduce handling cost.

limitation for local roads and streets. Major flood control structures are needed to overcome this limitation.

This Cahaba soil is in capability subclass IIe and in woodland suitability group 2o7.

13—Carnasaw-Bismarck-Sherless complex, 3 to 8 percent slopes. This map unit consists of deep, moderately deep, and shallow, well drained and somewhat excessively drained, gently sloping soils on foot slopes and valley floors. Areas of these soils are so intricately mixed or so small that it was not practical to separate them at the scale selected for mapping. Mapped areas range from about 50 to more than 1,000 acres. The individual areas are about 2 to 5 acres.

The deep Carnasaw soil makes up about 45 percent of the map unit. Typically, the surface layer is dark brown gravelly silt loam about 4 inches thick. The subsoil is yellowish red silty clay to a depth of about 15 inches and red silty clay to a depth of about 51 inches. Below that is weakly cemented, tilted and fractured, acid shale bedrock that has thin layers of sandstone.

Carnasaw soil is low in natural fertility and organic matter content. Reaction ranges from medium acid to very strongly acid in the surface layer, and it is strongly acid or very strongly acid in the subsoil. Permeability is slow, and available water capacity is moderate. Crops respond well to fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration.

The shallow Bismarck soil makes up about 25 percent of the map unit. Typically, the surface layer is dark brown very shaly loam about 3 inches thick. The subsurface layer is brown very shaly loam to a depth of about 7 inches. The subsoil is yellowish brown extremely shaly loam to a depth of about 14 inches. Below that is weakly cemented, tilted and fractured, acid shale bedrock.

Bismarck soil is low in natural fertility and organic matter content. Reaction ranges from medium acid to very strongly acid throughout. Permeability is moderate, and the available water capacity is very low. Shale fragments hinder tillage operations. The root zone is shallow.

The moderately deep Sherless soil makes up about 25 percent of the map unit. Typically, the surface layer is dark grayish brown fine sandy loam about 5 inches thick. The subsurface layer is light yellowish brown fine sandy loam to a depth of about 14 inches. The subsoil is yellowish red clay loam to a depth of about 31 inches. Below that is soft, tilted and fractured sandstone bedrock that has lenses of shale.

Sherless soil is low in natural fertility and organic matter content. Reaction ranges from very strongly acid to slightly acid in the surface layer and ranges from very strongly acid to medium acid in the subsurface layer. It is very strongly acid or strongly acid in the subsoil. Permeability is moderate, and the available water capacity is moderate. Crops respond well to fertilization. The soil has good tilth and can be tilled throughout a wide range of moisture content. The root zone is moderately deep.

Included in mapping are small areas of Bonnerdale, Clebit, Pirum, and Zafra soils. These included soils make up 5 percent of this map unit.

The soils in this map unit are poorly suited to cultivated crops, although grain sorghum and small grains can be grown. Runoff is rapid. Erosion is a very severe hazard if these soils are used for cultivated crops. If management practices that include minimum tillage, contour farming, terracing on the steeper slopes, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown occasionally. A close-growing cover crop should be kept on the soil most of the time. As slope length and gradient increase, conservation treatment should be intensified.

Carnasaw soil is moderately suited to pasture, Bismarck soil is poorly suited, and Sherless soil is well suited. Suitable pasture plants are bermudagrass, bahiagrass, clover, lespedeza, and tall fescue. Concerns in management include deferred grazing and weed and brush control.

The soils in this map unit mainly are used as woodland. Potential productivity is moderately high for commercial wood crops on Carnasaw and Sherless soils and is low on Bismarck soil. Suitable trees include loblolly pine and shortleaf pine. Carnasaw and Sherless soils have no significant limitations to woodland use or management. Seedling mortality is moderate on Bismarck soil because of coarse fragments in the surface layer and because of the shallow root zone.

Carnasaw soil is poorly suited to most urban uses. Slow permeability is a severe limitation for septic tank absorption fields. High shrink-swell potential is a severe limitation for dwellings and small commercial buildings. Low strength and shrink-swell potential are severe limitations for local roads and streets.

Bismarck soil is moderately suited to most urban uses. Depth to bedrock is a severe limitation for septic tank absorption fields and is a moderate limitation for dwellings and for local roads and streets. Depth to bedrock and slope are moderate limitations for small commercial buildings.

Sherless soil is moderately suited to most urban uses. Depth to bedrock is a severe limitation for septic tank absorption fields. Sherless soil has no significant limitations for dwellings and for local roads and streets. Slope is a moderate limitation for small commercial buildings.

Depth to bedrock limitations are difficult and generally impractical to overcome. An alternate site should be selected in most cases. Slope limitations for small commercial buildings are difficult to overcome and often require extensive cut and fill operations. An alternative is to design commercial buildings to conform to the natural contour of the land. A high shrink-swell limitation for

dwellings and small commercial buildings generally can be overcome by adequately reinforcing foundations.

Permeability limitations for septic tank absorption fields are also difficult to overcome. An alternate site should be selected in most cases. Increasing the size of the absorption field or using a specially designed alternate system can help offset these limitations.

Low strength and shrink-swell limitations for local roads and streets generally can be minimized by adding suitable subgrade fill material to the roadbed.

The soils in this map unit are in capability subclass IVe. Carnasaw and Sherless soils are in woodland suitability group 3o7. Bismarck soil is in woodland suitability group 5d8.

14—Carnasaw-Bismarck-Zafra complex, 8 to 20 percent slopes. This map unit consists of deep, moderately deep, and shallow, well drained and somewhat excessively drained, moderately sloping to moderately steep soils on side slopes in the Ouachita Mountains. Areas of these soils are so intricately mixed or so small that it was not practical to separate them at the scale selected for mapping. Mapped areas range from about 50 to more than 1,000 acres. The individual areas are about 3 to 5 acres.

The well drained, deep Carnasaw soil makes up about 35 percent of the map unit. Typically, the surface layer is dark brown gravelly silt loam about 4 inches thick. The subsoil is yellowish red silty clay to a depth of about 15 inches and red silty clay to a depth of about 51 inches. The underlying material is weakly cemented, tilted and fractured shale bedrock that has thin layers of sandstone.

Carnasaw soil is low in natural fertility and organic matter content. Reaction ranges from very strongly acid to medium acid in the surface layer and is very strongly acid or strongly acid in the subsoil. Permeability is slow, and the available water capacity is moderate. Pastures respond well to fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration.

The somewhat excessively drained, shallow Bismarck soil makes up about 25 percent of the map unit. Typically, the surface layer is dark brown very shaly loam about 3 inches thick. The subsurface layer is brown very shaly loam to a depth of about 7 inches. The subsoil is yellowish brown extremely shaly loam to a depth of about 14 inches. Below that is weakly cemented, fractured, acid shale.

Bismarck soil is low in natural fertility and organic matter content. Reaction ranges from very strongly acid to medium acid throughout. Permeability is moderate, and the available water capacity is very low. Pastures respond well to fertilization. The root zone is shallow.

The well drained, moderately deep Zafra soil makes up about 25 percent of the map unit. Typically, the surface layer is dark grayish brown stony fine sandy loam about 5 inches thick. The subsurface layer is yellowish brown very gravelly fine sandy loam to a depth of about 9 inches. The subsoil is yellowish brown very gravelly loam to a depth of about 12 inches and yellowish red very gravelly sandy clay loam to a depth of about 31 inches. The underlying material is tilted and fractured, soft sandstone that has lenses of shale to about 33 inches. Below that is tilted and fractured, hard sandstone that has lenses of shale.

Zafra soil is low in natural fertility and organic matter content. Reaction is strongly acid or medium acid in the surface layer and subsurface layer and is very strongly acid in the subsoil. Permeability is moderate, and the available water capacity is low. Pastures respond well to fertilization. The root zone is moderately deep and is easily penetrated by plant roots.

Included in mapping are small areas of Clebit, Pirum, and Sherwood soils. Also included are small areas of Yanush and Ceda soils on flood plains and foot slopes. The included soils make up 15 percent of this map unit.

The soils in this map unit are not suited to cultivated crops. The slope, surface stones, low available water capacity, rapid runoff, and depth to bedrock are the main limitations, and erosion is a very severe hazard.

Carnasaw soil is moderately suited to pasture and Bismarck and Zafra soils are poorly suited. Suitable pasture plants are bermudagrass, bahiagrass, clover, lespedeza, and fescue. Bismarck and Zafra soils are droughty because of the low available water capacity. Surface stones restrict the use of some mowing and bushhogging equipment. Other concerns in management include deferred grazing and weed and brush control.

The soils in this map unit mainly are used as woodland. Potential productivity is moderately high for commercial wood crops on Carnasaw soil, moderate on Zafra soil, and low on Bismarck soil. Suitable trees include loblolly pine, shortleaf pine, and eastern redcedar. Carnasaw soil has no significant limitations to woodland use and management. The shallow root zone and the very low available water capacity cause moderate seedling mortality on Bismarck soil. Surface stones cause moderate equipment limitations on Zafra soil.

Carnasaw soil is poorly suited to most urban uses. Slow permeability is a severe limitation for septic tank absorption fields. High shrink-swell potential is a severe limitation for dwellings. Slope and high shrink-swell potential are severe limitations for small commercial buildings. Low strength and high shrink-swell potential are severe limitations for local roads and streets.

Bismarck and Zafra soils are moderately suited to poorly suited to most urban uses. Depth to bedrock is a severe limitation for septic tank absorption fields. Depth to bedrock and slope are moderate limitations for dwellings and local roads and streets. Slope is a severe limitation for small commercial buildings.

Depth to bedrock limitations for septic tank absorption fields are difficult and generally impractical to overcome.

An alternate site should be selected in most cases. Permeability limitations for septic tank absorption fields are also difficult to overcome. Increasing the size of the absorption field or using a specially designed alternate system can help offset these limitations.

Slope limitations for dwellings and small commercial buildings often require extensive cut and fill operations. An alternative is to design dwellings and commercial buildings to conform to the natural contour of the land. Depth to bedrock limitations for dwellings and small commercial buildings may require building structures above the bedrock and adding fill material when landscaping the area. Shrink-swell limitations for dwellings and small commercial buildings generally can be overcome by adequately reinforcing foundations.

High shrink-swell potential and low strength limitations for local roads and streets generally can be offset by adding suitable subgrade fill material to the roadbed. Depth to bedrock limitations can require special planning as to proper location for streets and roads and proper grading of the sites to avoid the unnecessary removal of rock. Some areas will require blasting. The slope limitations for streets and roads generally can be offset by constructing on the contour and adapting the design to the slope.

The soils in this map unit are in capability subclass VIe. Carnasaw soil is in woodland suitability group 3o7. Bismarck soil is in woodland suitability group 5d8. Zafra soil is in woodland suitability group 4x8.

15—Carnasaw-Bismarck-Zafra complex, 20 to 40 percent slopes. This map unit consists of deep, moderately deep, and shallow, well drained and somewhat excessively drained, steep soils on side slopes in the Ouachita Mountains. Areas of these soils are so intricately mixed or so small that it was not practical to separate them at the scale selected for mapping. Mapped areas are about 50 to more than 1,000 acres. The individual areas are about 3 to 5 acres.

The well drained, deep Carnasaw soil makes up about 30 percent of the map unit. Typically, the surface layer is dark brown gravelly silt loam about 4 inches thick. The subsoil is yellowish red silty clay to a depth of about 15 inches and red silty clay to a depth of about 51 inches. The underlying material is weakly cemented, tilted and fractured shale bedrock that has thin layers of sandstone.

Carnasaw soil is low in natural fertility and organic matter content. Reaction ranges from very strongly acid to medium acid in the surface layer and is very strongly acid or strongly acid in the subsoil. Permeability is slow, and the available water capacity is moderate. The root zone is deep, but the clayey subsoil can restrict root penetration.

The somewhat excessively drained, shallow Bismarck soil makes up about 25 percent of the map unit. Typically, the surface layer is dark brown very shaly loam about 3 inches thick. The subsurface layer is brown very shaly loam to a depth of about 7 inches. The subsoil is yellowish brown extremely shaly loam to a depth of about 14 inches. Below that is weakly cemented, fractured, acid shale.

Bismarck soil is low in natural fertility and organic matter content. Reaction ranges from very strongly acid to medium acid throughout. Permeability is moderate, and the available water capacity is very low. The root zone is shallow.

The well drained, moderately deep Zafra soil makes up about 25 percent of the map unit. Typically, the surface layer is dark grayish brown stony fine sandy loam about 5 inches thick. The subsurface layer is yellowish brown very gravelly fine sandy loam to a depth of about 9 inches. The subsoil is yellowish brown very gravelly loam to a depth of about 12 inches and yellowish red very gravelly sandy clay loam to a depth of about 31 inches. The underlying material is tilted and fractured, soft sandstone that has lenses of shale to about 33 inches. Below that is tilted and fractured, hard sandstone that has lenses of shale.

Zafra soil is low in natural fertility and organic matter content. Reaction is strongly acid or medium acid in the surface layer and subsurface layer. It is very strongly acid in the subsoil. Permeability is moderate, and the available water capacity is low. The root zone is moderately deep and is easily penetrated by plant roots.

Included in mapping are some small areas of Clebit, Pirum, and Sherwood soils. Also included are some small areas of Yanush and Ceda soils on flood plains and foot slopes. These included soils make up 20 percent of the map unit.

The soils in this map unit are not suited to cultivated crops or improved pasture. Slope, surface stones, low available water capacity, rapid runoff, and depth to bedrock are the main limitations. Erosion is a very severe hazard.

The soils in this complex mainly are used as woodland. Potential productivity is moderately high on Carnasaw soil for commercial wood crops, moderate on Zafra soil, and low on Bismarck soil. Suitable trees include loblolly pine, shortleaf pine, and eastern redcedar. Slope is a moderate limitation to use of equipment on Carnasaw and Bismarck soils. Slope and surface stones are moderate limitations to use of equipment on Zafra soil. Erosion is a moderate hazard on these soils because of slope. Because of the shallow root zone of Bismarck soil, seedling mortality is a moderate limitation.

The soils in this map unit are poorly suited to most urban uses. On Carnasaw soil, slow permeability and slope are severe limitations for septic tank absorption fields. High shrink-swell potential and slope are severe limitations for dwellings and small commercial buildings. Low strength, slope, and high shrink-swell potential are severe limitations for local roads and streets. On

Bismarck and Zafra soils, depth to bedrock and slope are severe limitations for septic tank absorption fields. Slope is a severe limitation for dwellings and small commercial buildings and for local roads and streets.

Depth to bedrock limitations for septic tank absorption fields are difficult and generally impractical to overcome. An alternate site should be selected in most cases. Permeability and slope limitations for septic tank absorption fields are difficult to overcome. Increasing the size of the absorption field, installing distribution lines on the contour, or using a specially designed alternate system help offset these limitations.

Slope limitations for dwellings and small commercial buildings often need extensive cut and fill operations. An alternative is to design dwellings and small commercial buildings to conform to the natural contour of the land. High shrink-swell limitations for dwellings and small commercial buildings generally can be overcome by adequately reinforcing foundations.

High shrink-swell potential and low strength limitations for local roads and streets generally can be offset by adding suitable subgrade fill material to the roadbed. Slope limitation generally can be offset by constructing roads and streets on the contour and adapting the design to the slope.

The soils in this map unit are in capability subclass VIIe. Carnasaw soil is in woodland suitability group 3r8. Bismarck soil is in woodland suitability group 5d8. Zafra soil is in woodland suitability group 4x8.

16—Ceda gravelly fine sandy loam, occasionally flooded. This deep, well drained, level to nearly level soil is on flood plains and low terraces in the Ouachita Mountains. This soil is rapidly permeable. The individual areas are about 5 to 40 acres. The slopes are 0 to 3 percent.

Typically, the surface layer is dark grayish brown gravelly fine sandy loam about 7 inches thick. The subsurface layer is brown very gravelly fine sandy loam to a depth of about 15 inches. The underlying material is yellowish brown very gravelly loam to about 50 inches and yellowish brown extremely gravelly loam to a depth of 72 inches.

This soil is moderate in natural fertility and low in organic matter content. Reaction is slightly acid or medium acid throughout. Permeability is rapid, and the available water capacity is low. Crops respond well to fertilization. The gravel in the surface layer impedes tillage operations. The root zone is deep and is easily penetrated by plant roots.

This soil is occasionally flooded for very brief periods from January through July. If the soil does not have a vegetative cover, fast-moving floodwaters can cause severe damage in a short time.

Included with this soil in mapping are small areas of Kenn and Toine soils. Also included are a few small miscellaneous areas of gravelly sediment that is flooded and washed and reworked frequently by rivers.

This Ceda soil is poorly suited to crops, although soybeans, grain sorghum, and small grains can be grown. The low available water capacity and occasional flooding are the main limitations. Surface gravel hinders some tillage operations. If management practices that include minimum tillage and crop rotations are used, crops that leave a large amount of residue on the surface can be grown occasionally. A close-growing cover crop should be kept on the soil most of the time.

This soil is moderately suited to pasture or hayland. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Because of low available water capacity, the soil is droughty. Concerns in management include grazing and weed and brush control.

This soil mainly is used as woodland. Potential productivity is moderately high for commercial wood crops. Suitable trees include loblolly pine, shortleaf pine, American sycamore, and sweetgum. Seedling mortality is a moderate limitation to woodland use and management.

This soil is poorly suited to most urban uses. Flooding and rapid permeability are severe limitations for septic tank absorption fields. These limitations are difficult and generally impractical to overcome. An alternate site should be selected in most cases.

Flooding is a severe limitation for dwellings and small commercial buildings and for local roads and streets. Major flood control structures are needed to overcome this limitation.

This Ceda soil is in capability subclass IVs and in woodland suitability group 3f8.

17—Cuthbert fine sandy loam, 20 to 40 percent slopes. This moderately deep, well drained, steep soil is on side slopes in the Coastal Plain. The slopes are smooth and convex. The individual areas are about 50 to 200 acres.

Typically, the surface is dark grayish brown fine sandy loam about 5 inches thick. The subsurface layer is brown fine sandy loam to a depth of about 9 inches. The subsoil is red sandy clay to a depth of about 22 inches and red clay to a depth of about 29 inches. The underlying material is thinly stratified, red, gray, and yellowish brown, soft sandstone, shale, fine sandy loam, and sandy clay loam.

This soil is low in natural fertility and organic matter content. Reaction ranges from slightly acid to very strongly acid in the surface layer and subsurface layer and ranges from strongly acid to extremely acid in the subsoil and substratum. Permeability is moderately slow, and the available water capacity is low. The root zone is moderately deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Sacul and Smithdale soils. Also included are a few small areas of soils that have slopes of less than 20

percent, and also a few small areas that have slopes of more than 40 percent.

This Cuthbert soil is not suited to cultivated crops or improved pasture. Rapid runoff and steep slopes are very severe limitations. Erosion is a very severe hazard.

This soil mainly is used as woodland. Potential productivity is moderate for commercial wood crops. Suitable trees include loblolly pine and shortleaf pine. Restricted use of equipment is a moderate limitation to woodland use and management. Erosion is a severe hazard.

This soil is poorly suited to most urban uses. Slope and moderately slow permeability are severe limitations for septic tank absorption fields. These limitations are difficult or impractical to overcome. They can be partly alleviated by increasing the size of the absorption field, installing the system on the contour, or using a specially designed alternate system.

Slope is a severe limitation for dwellings and small commercial buildings. Extensive cut and fill operations may be necessary to overcome this limitation. An alternative is to design buildings and dwellings to conform to the natural contour of the land.

Low strength and slope are severe limitations for local roads and street. Adding suitable subgrade fill material to the roadbed and constructing on the contour generally can help offset these limitations.

This Cuthbert soil is in capability subclass VIIe and in woodland suitability group 4r3.

18—Darden loamy fine sand, 5 to 12 percent slopes. This deep, excessively drained soil is on hilltops and hillsides in the Coastal Plain. This soil is rapidly permeable. The slopes are smooth and convex. The individual areas are about 20 to 80 acres.

Typically, the surface layer is brown loamy fine sand to a depth of about 7 inches. The underlying material is brownish yellow loamy fine sand to a depth of about 30 inches; brownish yellow loamy sand to a depth of about 53 inches; and light yellowish brown loamy sand to a depth of 82 inches.

This soil is low in natural fertility and organic matter content. Reaction ranges from very strongly acid to slightly acid in the surface layer and in the upper part of the underlying material. It ranges from very strongly acid to neutral in the lower part of the underlying material. Permeability is rapid, and the available water capacity is low. This soil has good tilth and can be tilled throughout a wide range of moisture content. Crops respond well to fertilizer. This soil is somewhat droughty because of its high sand content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Smithdale, McLaurin, and Sacul soils. Also included are a few small areas of soils that have slopes of less than 5 percent, and also a few small areas of soils that have slopes of more than 12 percent.

This Darden soil is poorly suited to cultivated crops, although small grains, grain sorghum, and vegetable crops can be grown. Erosion is a very severe hazard if this soil is used for cultivated crops. If management practices that include minimum tillage and contour farming are used, crops that leave a large amount of residue on the surface can be grown occasionally. As slope length and gradient increase, conservation treatment should be intensified.

This soil is moderately suited to pasture. Suitable pasture plants are bermudagrass, bahiagrass, and lespedeza. Concerns in management include rotation grazing and weed and brush control.

This soil mainly is used as woodland. Potential productivity is moderately high for commercial wood crops. Suitable trees include loblolly pine and shortleaf pine. Because of the high content of sand, the use of equipment on this soil is a moderate limitation to woodland use and management, and seedling mortality is a severe limitation.

This soil is moderately suited to poorly suited to most urban uses. Poor filtering capacity of the soil is a severe limitation for septic tank absorption fields. The poor filtering capacity can result in the pollution of ground water. An alternate site should be selected in most cases.

Slope is a moderate limitation for dwellings and a severe limitation for small commercial buildings. This limitation can be partly alleviated by designing the dwellings and commercial buildings to conform to the natural contour of the land. Slope is a moderate limitation for local roads and streets. This limitation can be minimized by constructing roads and streets on the contour.

This Darden soil is in capability subclass IVe and in woodland suitability group 3s3.

19—Demopolis very channery silty clay loam, 3 to 12 percent slopes, severely eroded. This shallow, well drained, gently sloping to moderately sloping soil is on severely eroded ridgetops and side slopes in the Blackland Prairie. The slopes are smooth and convex. Erosion has removed most of the topsoil. A few rills and shallow gullies occur. The individual areas are about 5 to 15 acres.

Typically, the surface layer is dark grayish brown very channery silty clay loam about 3 inches thick. The underlying material is olive gray extremely channery silty clay loam to a depth of about 7 inches. Below that is light olive gray, mottled chalk that can be cut with a spade.

This soil is moderate in natural fertility and low in organic matter content. Reaction is mildly alkaline or moderately alkaline. This soil is calcareous throughout. Permeability is moderately slow, and the available water capacity is very low. The soil has poor tilth and can be

tilled only within a narrow range of moisture content. The root zone is very shallow.

Included with this soil in mapping are a few small areas of Sumter and Oktibbeha soils. Also included are a few soils in deep gullies and a few small miscellaneous areas of chalk outcrops.

This Demopolis soil is not suited to cultivated crops. Past cultivation has resulted in the loss of most of the topsoil, numerous rills, and a few shallow gullies. Erosion is a very severe hazard if this soil is used for cultivated crops. These soils should not be cleared of their native vegetation.

This soil mainly is used as native pasture. It is moderately suited to this use. Suitable plants are little bluestem, big bluestem, indiangrass, and switchgrass. Concerns in management include proper stocking, erosion control, and brush control.

Potential productivity is low for commercial wood crops. Suitable tree to plant is eastern redcedar. Erosion is a moderate hazard. Seedling mortality is a severe limitation to woodland use and management.

This soil is moderately suited to most urban uses. Depth to bedrock is a severe limitation for septic tank absorption fields and a moderate limitation for dwellings and small commercial buildings and for local roads and streets. Slope is a moderate limitation for small commercial buildings. This limitation is difficult and generally impractical to overcome. An alternate site should be selected in most cases.

This Demopolis soil is in capability subclass VIe and in woodland suitability group 5d9.

20—Eutaw silty clay loam, 0 to 2 percent slopes. This deep, poorly drained, level to nearly level soil is on upland flats in the Blackland Prairie. The slopes are smooth and slightly concave. The individual areas are about 10 to 50 acres.

Typically, the surface layer is dark gray silty clay loam to a depth of about 5 inches. The subsoil is gray, mottled clay to a depth of about 28 inches. The underlying material is gray, mottled clay to a depth of 72 inches.

This soil is moderate in natural fertility and low in organic matter content. Reaction ranges from extremely acid to medium acid in the surface layer, in the subsoil, and in the upper part of the substratum. It ranges from very strongly acid to mildly alkaline in the lower part of the substratum. Permeability is very slow, and the available water capacity is high. This soil has a very high shrink-swell potential, and cracks that are several inches deep can occur in the surface layer during dry periods. A seasonal high water table is within a depth of 6 inches from December through April. This soil has poor tilth and can only be tilled within a very narrow range of moisture content. Crops respond well to fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration.

Included with this soil in mapping are a few small areas of Kipling and Mayhew soils.

This Eutaw soil is moderately suited to cultivated crops. Suitable crops include soybeans, rice, grain sorghum, and small grains. Runoff is slow, and water often ponds. Tillage operations are restricted to within a narrow range of moisture content. If management practices that include drainage, minimum tillage, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include deferred grazing and weed and brush control. Excessive wetness often limits grazing during the winter and the spring. Grazing when the soil is saturated causes sod damage and surface compaction.

This soil mainly is used as woodland. Potential productivity is moderately high for commercial wood crops. Suitable trees include loblolly pine, eastern redcedar, and sweetgum. Seedling mortality is a moderate limitation because of wetness. This limitation can be partly offset by planting seedlings on a raised seedbed. Wetness and depth to clay are moderate limitations for equipment use. This limitation can be minimized by scheduling harvesting operations in the summer and in the fall.

This soil is poorly suited to most urban uses. Wetness and very slow permeability are severe limitations for septic tank absorption fields. These limitations can be partly alleviated by increasing the size of the absorption field, using a specially designed alternate system, and installing a drainage system around the perimeter.

Wetness and high shrink-swell potential are severe limitations for dwellings and small commercial buildings and for local roads and streets. The wetness limitations can be offset by installing surface diversions and subsurface drainage systems. The high shrink-swell potential limitation can be offset by adequately reinforcing foundations of dwellings and small commercial buildings.

Constructing roads and streets on raised suitable subgrade fill material helps offset the wetness limitation and high shrink-swell potential of this soil for local roads and streets.

This Eutaw soil is in capability subclass IIIw and in woodland suitability group 3c8.

21—Foley silt loam, 0 to 2 percent slopes. This deep, poorly drained, level to nearly level soil is on stream terraces and upland flats in the Coastal Plain. The slopes are smooth and convex. The individual areas are about 5 to 40 acres.

Typically, the surface layer is dark grayish brown silt loam about 5 inches thick. The subsurface layer is grayish brown, mottled silt loam to a depth of about 13 inches. The subsoil is light brownish gray, mottled silt

loam to a depth of about 23 inches; light brownish gray, mottled silty clay loam to a depth of about 45 inches; and mottled pale brown, gray, and yellowish brown silt loam to a depth of 72 inches.

This soil is moderate in natural fertility and low in organic matter content. The middle and lower part of the subsoil contain a high concentration of sodium that can be toxic to plant roots. Reaction is strongly acid or medium acid in the surface layer and subsurface layer. It ranges from strongly acid to neutral in the upper part of the subsoil and from neutral to moderately alkaline in the middle part. It ranges from neutral to strongly alkaline in the lower part of the subsoil and in the substratum. Permeability is very slow, and the available water capacity is moderate. A seasonal high water table is within a depth of 12 inches from December through April. This soil has good tilth and can be tilled throughout a wide range of moisture content. Shaping and leveling can bring parts of the subsoil that is high in sodium to the surface. Soils in these areas will have very poor tilth because of dispersion that is caused by the high concentration of sodium. Before shaping or leveling operations are started, investigation should be made to determine where the high concentration of sodium is in the soil layers. The root zone is moderately deep, and roots can only penetrate to the upper part of the subsoil because of the sodium concentration in the lower layers. This soil is commonly droughty.

Included with this soil in mapping are a few small areas of Amy, Gurdon, and Stough soils. Also included are a few small sandy areas that occur as mounds.

This Foley soil is moderately suited to cultivated crops. Suitable crops include rice, soybeans, grain sorghum, and small grains. Runoff is slow and water often ponds on the flatter to depressional parts of the soil. A high sodium concentration in the subsoil can reduce yields unless an irrigation system is installed and unless crops are rotated. If management practices that include drainage, irrigation, minimum tillage, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year.

This soil is moderately suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include deferred grazing and weed control.

This soil mainly is used as woodland. Potential productivity is moderately high for commercial wood products. Suitable trees include loblolly pine, sweetgum, and American sycamore. Seedling mortality and restricted use of equipment are moderate limitations to woodland use and management. Planting seedlings on raised seedbeds and scheduling harvesting operation in dry periods can help offset these limitations.

This soil is poorly suited to most urban uses. Slow permeability and wetness are severe limitations for septic tank absorption fields. These limitations are difficult and often impractical to overcome, but they can be partly overcome by increasing the size of the absorption field, using a specially designed alternate system, and installing a subsurface drainage system around the perimeter.

Wetness is a severe limitation for dwellings and small commercial buildings. Surface diversions and a subsurface drainage system can partly alleviate this limitation.

Wetness and low strength are severe limitations for local roads and streets. Constructing roads and streets on raised suitable subgrade fill material helps to minimize these limitations.

This Foley soil is in capability subclass IIIw and in woodland suitability group 3w8.

22—Gurdon silt loam, 1 to 3 percent slopes. This deep, somewhat poorly drained, nearly level soil is on stream terraces in the Coastal Plain. This soil is rarely flooded. The slopes are smooth and convex. The individual areas are about 20 to 100 acres.

Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The subsoil is yellowish brown, mottled silt loam to a depth of about 30 inches; mottled yellowish brown and gray silt loam to a depth of about 50 inches; yellowish brown, mottled silt loam to a depth of about 64 inches; and yellowish brown, mottled silty clay loam to a depth of 72 inches.

This soil is low in natural fertility and organic matter content. Reaction ranges from medium acid to extremely acid throughout. Permeability is moderate, and the available water capacity is high. A seasonal high water table is at a depth of 12 to 24 inches from December through March. This soil has good tilth, but wetness often delays tillage operations. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Amy, Stough, and Foley soils. Also included are a few small sandy areas that occur as rounded mounds.

This Gurdon soil is well suited to cultivated crops. Suitable crops include rice, soybeans, grain sorghum, and small grains. Runoff is slow. Erosion is a moderate hazard if this soil is used for cultivated crops. If management practices that include minimum tillage and contour farming are used, crops that leave a large amount of residue on the surface can be grown year after year. Crops that leave a large amount of residue on the surface reduce surface crusting, increase organic matter, and improve tilth. As slope length and gradient increase, conservation treatment should be intensified.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

This soil mainly is used as woodland. Potential productivity is high for commercial wood crops. Suitable

trees include loblolly pine, cherrybark oak, Shumard oak, and sweetgum. Wetness is a moderate limitation to use of equipment on this soil for woodland use and management. It is difficult or impractical to overcome this limitation; but by using equipment during the dry periods, this limitation can be minimized.

This soil is poorly suited to most urban uses. Wetness is a severe limitation for septic tank absorption fields. This limitation is difficult of impractical to overcome, but installing a subsurface drainage system around the perimeter helps to alleviate this wetness limitation.

Wetness and rare flooding are severe limitations for dwellings and small commercial buildings. These limitations are difficult and often impractical to overcome. Major flood control structures are necessary to overcome the flooding limitation. Installing diversions and drainage systems can help to alleviate the wetness limitation for dwellings and small commercial buildings.

Wetness and flooding are moderate limitations for local roads and streets. Constructing local roads and streets on raised suitable subgrade fill material can help offset the wetness limitation. Major flood control structures are needed to overcome the flooding limitation.

This Gurdon soil is in capability subclass IIe and in woodland suitability group 2w8.

23—Gurdon silt loam, occasionally flooded. This deep, somewhat poorly drained, level soil is on stream terraces in the Coastal Plain. The individual areas are about 10 to 200 acres. The slopes are 0 to 1 percent.

Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The subsoil is yellowish brown, mottled silt loam to a depth of 30 inches; mottled yellowish brown and gray silt loam to a depth of about 50 inches; yellowish brown, mottled silt loam to a depth of about 64 inches; and yellowish brown, mottled silty clay loam to a depth of 72 inches.

This soil is low in natural fertility and organic matter content. Reaction ranges from medium acid to extremely acid throughout. Permeability is moderate, and the available water capacity is high. A seasonal high water table is at a depth of 12 to 24 inches from December through March. This soil has good tilth; however, wetness often delays tillage operations. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

This soil is flooded occasionally from December through March. Flooding generally lasts 1 to 3 days. If this soil does not have a vegetative cover, fast-moving floodwaters can cause severe scouring in a short time.

Included with this soil in mapping are a few small areas of Amy, Stough, and Foley soils. Also included are a few small sandy areas that occur as rounded mounds.

This Gurdon soil is well suited to cultivated crops. Suitable crops include rice (fig. 4), soybeans, grain sorghum, and small grains. Runoff is slow. Flooding is an occasional hazard if this soil is used for cultivated crops. Tillage operations are often delayed several days after a rain unless drainage systems have been installed. If management practices that include minimum tillage, drainage, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include proper grazing and weed and brush control.

This soil mainly is used as woodland. Potential productivity is high for commercial wood crops. Suitable trees include loblolly pine, cherrybark oak, Shumard oak, and sweetgum. Wetness is a moderate limitation to use of equipment in woodland management (fig. 5). This limitation is difficult to overcome, but it can be minimized by using equipment during the dry periods.

This soil is poorly suited to most urban uses. Wetness and flooding are severe limitations for septic tank absorption fields and for dwellings and small commercial buildings. Flooding is a severe limitation for local roads and streets. These limitations are difficult and often impractical to overcome. Installing drainage systems helps to alleviate the wetness limitation. Major flood control structures are necessary to overcome the flooding limitation.

This Gurdon soil is in capability subclass IIw and in woodland suitability group 2w8.

24—Guyton silt loam, occasionally flooded. This deep, poorly drained, level soil is on flood plains and low stream terraces in the Coastal Plain. The individual areas are about 10 to 100 acres. The slopes are 0 to 1 percent.

Typically, the surface layer is grayish brown silt loam about 5 inches thick. The subsurface layer is gray, mottled silt loam to a depth of about 23 inches. The subsoil is gray, mottled loam to a depth of about 44 inches and gray, mottled silt loam to a depth of 72 inches.

This soil is moderate in natural fertility and low in organic matter content. Reaction ranges from extremely acid to medium acid in the surface and subsurface layers and in the upper part of the subsoil and ranges from strongly acid to moderately alkaline in the lower part of the subsoil and in the substratum. Permeability is slow, and the available water capacity is high. A seasonal water table is at or within a depth of 18 inches from November through May. Water ponds in the depressional areas of this soil. Wetness often delays tillage operations. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

This soil is flooded occasionally from December through May. Flooding generally lasts 1 to 3 days.

Figure 4.—Rice on Gurdon silt loam, occasionally flooded. Excellent yields of rice can be obtained on this soil.

Figure 5.—Wetness on Gurdon silt loam, occasionally flooded, is a moderate limitation for use of equipment in woodland management.

Included with this soil in mapping are a few small areas of Ouachita and Sardis soils. Also included are a few small sandy areas that occur as rounded mounds.

This Guyton soil is poorly suited to cultivated crops. Wetness and a seasonal high water table are the main limitations. Tillage operations are often delayed for several days after a rain if an adequate drainage system is not installed. Suitable crops include grain sorghum, soybeans, small grains, and rice. If management practices that include drainage, minimum tillage, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year.

This soil is moderately suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Wetness restricts the use of some farm equipment and limits grazing in the winter and early in the spring. Grazing when the soil is saturated causes sod damage and surface compaction. Other concerns in management include deferred grazing, rotation grazing, and weed control.

This soil mainly is used as woodland. Potential productivity is high for commercial crops. Suitable trees include loblolly pine and sweetgum. Seedling mortality is a moderate limitation to woodland use and management. This limitation can be partly alleviated by planting on a raised seedbed. Wetness is severe limitation to use of equipment. Scheduling planting and harvesting operations during the dry periods can help offset this limitation.

This soil is poorly suited to most urban uses. Flooding, wetness, and slow permeability are severe limitations for septic tank absorption fields. These limitations are difficult and generally impractical to overcome. An alternate site should be selected in most cases.

Flooding and wetness are severe limitations for dwellings and small commercial buildings. Surface diversions and a subsurface drainage system can help to alleviate the wetness limitation.

Low strength, wetness, and flooding are severe limitations for local roads and streets. It may be necessary to construct roads and streets on raised suitable subgrade fill material to overcome the low soil strength and wetness limitations.

Major flood control structures are needed to overcome the flooding limitation for urban use.

This Guyton soil is in capability subclass IVw and in woodland suitability group 2w9.

25—Guyton silt loam, ponded. This deep, very poorly drained, depressional soil is on flood plains and low terraces in the Coastal Plain. Ponded water is on the surface most of the year (fig. 7). The individual areas are about 3 to 10 acres. The slopes are 0 to 1 percent.

Typically, the surface layer is grayish brown silt loam about 5 inches thick. The subsurface layer is gray, mottled silt loam to a depth of about 23 inches. The subsoil is gray, mottled loam to a depth of about 44 inches and gray, mottled silt loam to a depth of 72 inches.

This soil is moderate in natural fertility and low in organic matter content. Reaction ranges from extremely acid to medium acid in the surface and subsurface layers and in the upper part of the subsoil and ranges from strongly acid to moderately alkaline in the lower part of the subsoil and in the substratum. Permeability is slow, and the available water capacity is high. Ponded water is on the surface of this soil, or the seasonal high water table is within a depth of about 36 inches most of the year. The root zone is deep and is easily penetrated by water-tolerant plants.

This soil is flooded frequently throughout the year. Flooding generally lasts from 1 to 5 days. In addition, this soil is normally ponded.

Included with this soil in mapping are a few small areas of Sardis soils. Also included are a few small areas of water that will not support vegetation.

This Guyton soil is not suited to cultivated crops or pasture. Ponded water, wetness, and flooding are severe limitations. It is impractical to overcome these limitations.

This soil mainly is used as woodland. Potential productivity is high for some commercial wood crops. Suitable trees include baldcypress (fig. 6) and water tupelo. Because of very poor drainage and ponded water, seedling mortality is severe. Wetness and ponded water are severe limitations to use of equipment for woodland use and management. An abnormally dry year may be necessary or special equipment may be needed for logging operations.

This soil is poorly suited to most urban uses. Flooding, slow permeability, and ponding are severe limitations for septic tank absorption fields. Flooding and ponding are severe limitations for dwellings and small commercial buildings and for local roads and streets. These limitations are impractical to overcome. Low strength is also a severe limitation for local roads and streets. An alternate site should be selected in most cases.

This Guyton soil is in capability subclass VIIw and in woodland suitability group 2w9.

26—Harleston fine sandy loam, 1 to 3 percent slopes. This deep, moderately well drained, nearly level soil is on stream terraces and upland flats in the Coastal Plain. This soil is rarely flooded. The individual areas are about 10 to 50 acres.

Typically, the surface layer is dark brown fine sandy loam about 4 inches thick. The subsurface layer is yellowish brown fine sandy loam to a depth of about 9 inches. The subsoil is light yellowish brown sandy loam to a depth of about 24 inches; light yellowish brown, mottled sandy loam to a depth of about 36 inches; yellowish brown, mottled sandy clay loam to a depth of about 48 inches; and coarsely mottled yellowish brown, light brownish gray, and light yellowish brown sandy clay loam to a depth of 72 inches.

Figure 6.—Baldcypress is the main tree grown on Guyton silt loam, ponded.

This soil is low in natural fertility and organic matter content. Reaction ranges from strongly acid to extremely acid throughout. Permeability is moderate, and the available water capacity is moderate. A seasonal high water table is at a depth of 24 to 36 inches from November through March. This soil has good tilth, but wetness often delays tillage operations. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Stough and Smithton soils. Also included are a few small sandy areas that occur as rounded mounds.

This Harleston soil is well suited to cultivated crops. Suitable crops include soybeans, grain sorghum, and small grains. Runoff is slow or medium. Erosion is a slight to moderate hazard if this soil is used for cultivated crops. If management practices that include minimum tillage, drainage, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year. Crops that leave a large amount of surface residue reduce surface crusting, increase organic matter, and improve tilth.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include proper grazing and weed and brush control.

This soil mainly is used as woodland. Potential productivity is high for commercial wood crops. Suitable trees include loblolly pine and sweetgum. Wetness is a moderate limitation to use of equipment for woodland use and management. This limitation is difficult or impractical to overcome but can be minimized by planting and harvesting during the dry periods.

This soil is poorly suited to most urban uses. Wetness is a severe limitation for septic tank absorption fields. This limitation is difficult to overcome. Installing a subsurface drainage system around the perimeter of the absorption field can partly alleviate this wetness limitation.

Rare flooding is a severe limitation for dwellings and small commercial buildings. Flooding and wetness are moderate limitations for local roads and streets. These limitations are difficult or impractical to overcome. Major flood control structures are needed to overcome the flooding limitation.

This Harleston soil is in capability subclass IIw and in woodland suitability group 2w8.

27—Houston clay, 1 to 3 percent slopes. This deep, moderately well drained, nearly level soil is on uplands in the Blackland Prairie. The slopes are smooth and convex. The individual areas are about 10 to 100 acres.

Typically, the surface layer is very dark gray clay about 6 inches thick. The subsurface layer is dark olive gray clay to a depth of about 20 inches. The underlying material is olive, mottled clay to a depth of about 31 inches; yellowish brown, mottled clay to a depth of about 61 inches; and light olive brown, mottled clay to a depth of 72 inches.

This soil is high in natural fertility and moderate to high in organic matter content. Reaction ranges from slightly acid to mildly alkaline in the surface and subsurface layers, slightly acid to mildly alkaline in the upper part of the substratum, and neutral to moderately alkaline in the lower part. Permeability is very slow, and the available water capacity is high. A seasonal high water table is within a depth of 48 inches from January through March. This soil shrinks and cracks when dry and expands and swells when wet. It has poor tilth and can only be tilled within a very narrow range of moisture content. Crops respond well to nitrogen and potash fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration.

Included with this soil in mapping are a few small areas of Sumter and Kipling soils. Also included are a few areas of eroded soils and a few areas of soils that are similar to Houston soil except they are more acid.

This Houston soil is well suited to cultivated crops, and this is its main use. Suitable crops include soybeans, grain sorghum, and small grains. Runoff is slow or medium. Erosion is a moderate hazard if this soil is used for cultivated crops. The clayey surface layer is sticky and plastic when wet and very hard when dry. This makes tillage operations difficult. If management

Figure 7.—Water ponds on Guyton silt loam, ponded, for most of the year.

practices that include minimum tillage, contour farming, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year. As slope length and gradient increase, conservation treatment should be intensified.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include proper grazing and weed and brush control.

Potential productivity is moderate for commercial wood crops. Seedling mortality and restricted use of equipment are moderate limitations to woodland use and management because of the clayey surface layer. Scheduling planting and harvesting operations in the dry periods will minimize these limitations.

This soil is poorly suited to most urban uses. Very slow permeability is a severe limitation for septic tank absorption fields. This limitation is generally impractical to overcome. An alternate site should be selected.

High shrink-swell potential (fig. 8) is a severe limitation for dwellings and small commercial buildings. Adequately reinforcing foundations can help offset this limitation.

Low strength and high shrink-swell potential are severe limitations for local roads and streets. Adding suitable subgrade fill material to the roadbed can help offset these limitations.

This Houston soil is in capability subclass IIe and in woodland suitability group 4c8.

28—Houston clay, 3 to 8 percent slopes, eroded. This deep, moderately well drained, gently sloping soil is on upland side slopes in the Blackland Prairie. The individual areas are about 15 to 80 acres.

Typically, the surface layer is very dark gray clay about 6 inches thick. The subsurface layer is dark olive gray

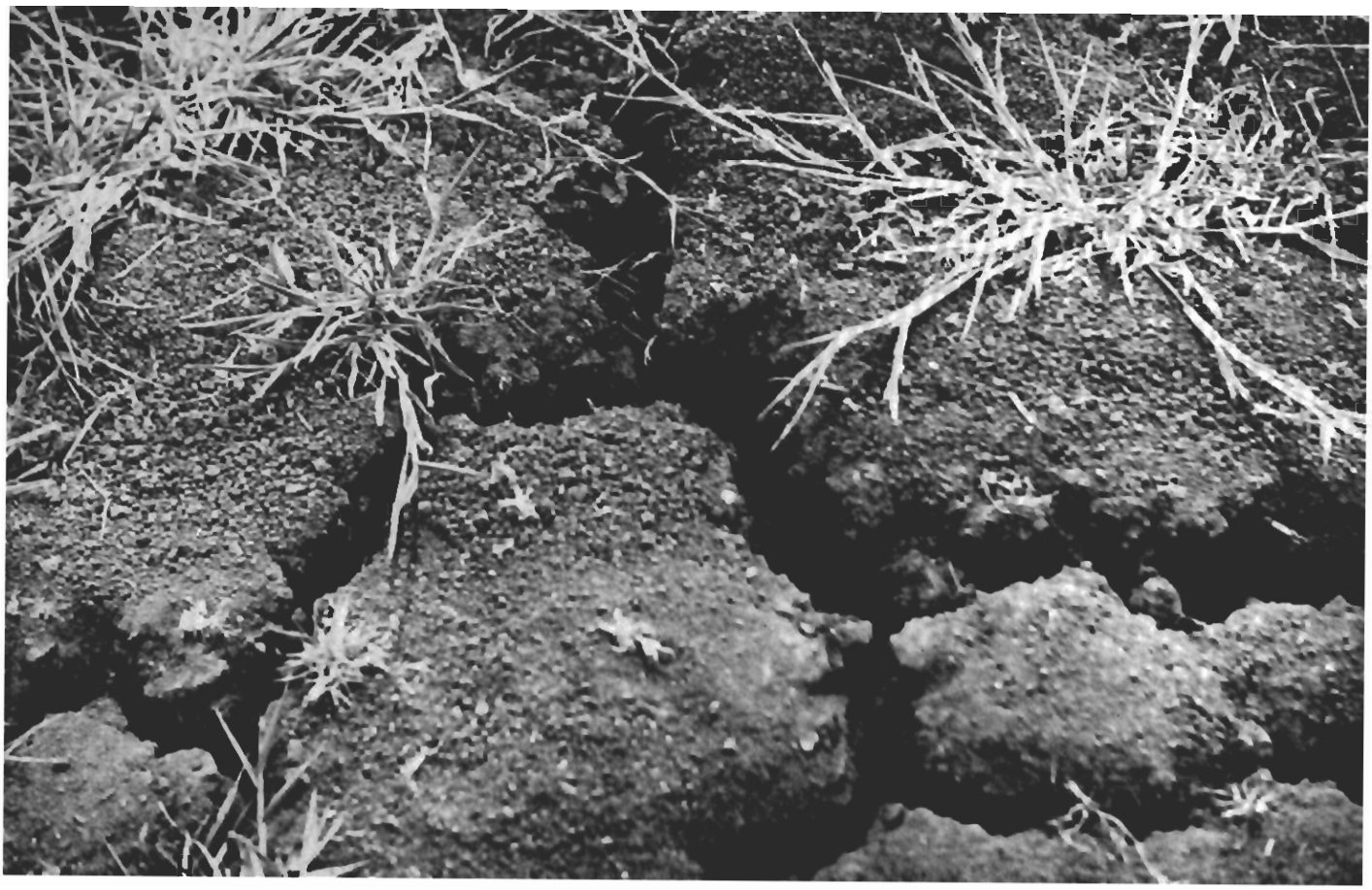


Figure 8.—High-shrink swell potential is a severe limitation for dwellings, small commercial buildings, and local roads and streets on Houston clay, 1 to 3 percent slopes.

Figure 9.—Erosion has removed some of the topsoil, and a few shallow rills and gullies have formed on Houston clay, 3 to 8 percent slopes, eroded.

clay to a depth of about 20 inches. The underlying material is olive, mottled clay to a depth of about 31 inches; yellowish brown, mottled clay to a depth of about 61 inches; and light olive brown, mottled clay to a depth of 72 inches.

This soil is high in natural fertility and moderate to high in organic matter content. Reaction ranges from slightly acid to mildly alkaline in the surface and subsurface layers, slightly acid to mildly alkaline in the upper part of the substratum, and neutral to moderately alkaline in the lower part. Permeability is very slow, and the available water capacity is high. A seasonal high water table is within a depth of 48 inches from January through March. This soil shrinks and cracks when dry and expands and swells when wet. It has poor tilth and can only be tilled within a very narrow range of moisture content. Crops respond well to nitrogen and potash fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration. Erosion has removed some of the topsoil, and a few shallow rills and shallow gullies have formed (fig. 9).

Included with this soil in mapping are a few small areas of Demopolis, Sumter, and Kipling soils. Also included are some soils that are similar to Houston soil except they are more acid.

This Houston soil is poorly suited to cultivated crops, although grain sorghum and small grains can be grown. Runoff is medium or rapid. Erosion is a very severe hazard if this soil is used for cultivated crops. The clayey surface layer is sticky and plastic when wet and very hard when dry. This makes tillage operations difficult. If management practices that include minimum tillage, contour farming, terracing, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown occasionally. A close-growing cover crop should be kept on the soil most of the time.

As slope length and gradient increase, conservation treatment should be intensified.

This soil is well suited to pasture or hay crops, and this is its main use. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include erosion control, rotation grazing, and weed and brush control.

Potential productivity is moderate for commercial wood crops. Seedling mortality and restricted use of equipment are moderate limitations to woodland use and management because of the clayey surface layer. Scheduling the planting and harvesting operations in the dry periods will minimize these limitation.

This soil is poorly suited to most urban uses. Very slow permeability is a severe limitation for septic tank absorption fields. This limitation is generally impractical to overcome. An alternate site should be selected in most cases.

High shrink-swell potential is a severe limitation for dwellings and small commercial buildings. Adequately reinforcing foundations can help offset this limitation.

Low strength and high shrink-swell potential are severe limitations for local roads and streets. Adding suitable subgrade fill material to the roadbed can help offset these limitations.

This Houston soil is in capability subclass IVe and in woodland suitability group 4c8.

29—Iuka fine sandy loam, occasionally flooded. This deep, moderately well drained, level soil is on flood plains in the Coastal Plain. The individual areas are 5 to 100 acres. The slopes are 0 to 1 percent.

Typically, the surface layer is dark brown fine sandy loam about 5 inches thick. The subsurface layer is brown fine sandy loam to a depth of about 13 inches. The underlying material is yellowish brown, mottled fine sandy loam to a depth of about 29 inches; light brownish gray, mottled fine sandy loam to a depth of about 45 inches; and gray, mottled loam to a depth of 72 inches.

This soil is moderate in natural fertility and low in organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability is moderate, and the available water capacity is moderate. A seasonal high water table is at a depth of 12 to 36 inches from December through April. This soil has good tilth, but flooding and wetness can delay tillage operations. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

This soil is flooded occasionally for very brief to brief periods from December through April. If the soil does not have vegetative cover, fast-moving floodwaters can cause severe erosion of the topsoil.

Included with this soil in mapping are a few small areas of Ochlockonee, Ouachita, and Smithton soils. Also included are a few narrow areas of water.

This Iuka soil is well suited to cultivated crops. Suitable crops include soybeans, grain sorghum, and small grains. Occasional flooding may delay planting and tillage operations in the spring. If management practices that include minimum tillage and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

This soil mainly is used as woodland. Potential productivity is very high for commercial wood crops. Suitable trees include loblolly pine, eastern cottonwood, and sweetgum. Wetness is a moderate limitation to equipment use for woodland use and management.

This soil is poorly suited to most urban uses. Flooding and wetness are severe limitations for septic tank absorption fields. These limitations are difficult and generally impractical to overcome. Flooding is a severe limitation for dwellings and small commercial buildings and for local roads and streets. Major flood control structures are needed to overcome the flooding limitation for urban use.

This Iuka soil is in capability subgroup IIw and in woodland suitability group 1w8.

30—Kenn fine sandy loam, occasionally flooded. This deep, well drained, level soil is on flood plains and low terraces in the Ouachita Mountains. The individual areas are 10 to 50 acres. The slopes are 0 to 3 percent.

Typically, the surface layer is brown fine sandy loam about 8 inches thick. The subsoil is yellowish red sandy clay loam to a depth of about 28 inches and strong brown very gravelly sandy clay loam to a depth of about 41 inches. The underlying material is brown extremely gravelly fine sandy loam to a depth of 72 inches.

This soil is moderate in natural fertility and low in organic matter content. Reaction ranges from strongly acid to slightly acid in the surface layer and is strongly acid or very strongly acid in the subsoil and substratum. Permeability is moderate, and the available water capacity is moderate. This soil has good tilth and can be tilled throughout a wide range of moisture content. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

This soil is flooded occasionally from December through July. This flooding generally lasts from 1 to 2 days. If the soil does not have vegetative cover, fast-moving floodwaters can cause severe erosion of the topsoil.

Included with this soil in mapping are a few small areas of Ceda and Toine soils. Also included are a few small areas of sandy or gravelly overwash.

This Kenn soil is well suited to cultivated crops. Suitable crops include soybeans, grain sorghum, and small grains. Occasional flooding can delay tillage operations early in the spring. Runoff is slow. Erosion is

a slight hazard if this soil is used for cultivated crops. If management practices that include minimum tillage and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include deferred grazing and weed and brush control.

This Kenn soil mainly is used as woodland. Potential productivity is moderately high for commercial wood crops. Suitable trees include shortleaf pine and loblolly pine. This soil has no significant limitations to woodland use and management.

This soil is poorly suited to most urban uses. Occasional flooding is a severe limitation for septic tank absorption fields, dwellings and small commercial buildings, and local roads and streets. This limitation is difficult and is generally impractical to overcome. Major flood control structures are needed to overcome this limitation.

This Kenn soil is in capability subclass IIw and in woodland suitability group 3o7.

31—Kipling silt loam, 0 to 2 percent slopes. This deep, somewhat poorly drained, level to nearly level soil is on uplands in the Blackland Prairie. The slopes are smooth and convex. The individual areas are about 10 to 100 acres.

Typically, the surface layer is dark grayish brown silt loam about 5 inches thick. The subsurface layer is brown, mottled silty clay loam to a depth of about 12 inches. The subsoil is mottled yellowish brown, light brownish gray, and yellowish red silty clay loam to a depth of about 24 inches; mottled light brownish gray, yellowish brown, and yellowish red clay to a depth of about 33 inches; mottled light brownish gray, olive yellow, yellowish brown, and yellowish red clay to a depth of about 45 inches; and mottled light brownish gray, olive yellow, and yellowish red clay to a depth of about 54 inches. The underlying material is mottled yellowish brown, grayish brown, and olive yellow clay to a depth of 72 inches.

This soil is moderate in natural fertility and low in organic matter content. Reaction ranges from medium acid to extremely acid in the surface and subsurface layers and in the upper part of the subsoil and ranges from very strongly acid to moderately alkaline in the lower part of the subsoil and in the underlying material. Permeability is very slow, and the available water capacity is high. A seasonal high water table is at a depth of 18 to 36 inches from January through March. This soil has poor tilth and can only be tilled within a very narrow range of moisture content. Crops respond well to nitrogen and potash fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration.

Included with this soil in mapping are a few small areas of Mayhew, Eutaw, Oktibbeha, and Houston soils.

This Kipling soil is moderately suited to cultivated crops. Suitable crops include rice, soybeans, grain sorghum, and small grains. Runoff is slow, and wetness often delays tillage operations. If management practices that include minimum tillage, contour farming, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year.

This soil is moderately suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Wetness restricts the use of some farm equipment and limits grazing in the winter and early in the spring. Grazing when the soil is saturated causes sod damage and surface compaction. Other concerns in management include deferred grazing, rotation grazing, and weed control.

This soil mainly is used as woodland. Potential productivity is high for commercial crops. Suitable trees include loblolly pine, cherrybark oak, Shumard oak, and sweetgum. Seedling mortality and restricted use of equipment are moderate limitations to woodland use and management. These limitations can be partly offset by planting on a raised seedbed and by scheduling planting and harvesting operations during dry periods when possible.

This soil is poorly suited to most urban uses. Wetness and very slow permeability are severe limitations for septic tank absorption fields. These limitations are generally impractical to overcome. An alternate site should be selected in most cases.

High shrink-swell potential is a severe limitation for dwellings and small commercial buildings. Adequately reinforcing foundations can help offset this limitation.

Low strength and very high shrink-swell potential are severe limitations for local roads and streets. Adding suitable subgrade fill material to the roadbed can help offset these limitations.

This Kipling soil is in capability subclass IIIw and in woodland suitability group 2c8.

32—Kipling silty clay loam, 2 to 5 percent slopes. This deep, somewhat poorly drained, gently sloping soil is on uplands in the Blackland Prairie. The slopes are smooth and convex. The individual areas are 20 to 100 acres.

Typically, the surface layer is dark grayish brown silty clay loam about 5 inches thick. The subsurface layer is brown, mottled silty clay loam to a depth of about 12 inches. The subsoil is mottled yellowish brown, light brownish gray, and yellowish red silty clay loam to a depth of about 24 inches; mottled light brownish gray, yellowish brown, and yellowish red clay to a depth of about 33 inches; mottled light brownish gray, olive yellow, yellowish brown, and yellowish red clay to a depth of about 45 inches; and mottled light brownish gray, olive yellow, and yellowish red clay to a depth of

about 54 inches. The underlying material is mottled yellowish brown, grayish brown, and olive yellow clay to a depth of 72 inches.

This soil is moderate in natural fertility and low in organic matter content. Reaction ranges from medium acid to extremely acid in the surface and subsurface layers and in the upper part of the subsoil and ranges from very strongly acid through moderately alkaline in the lower part of the subsoil and in the underlying material. Permeability is very slow, and the available water capacity is high. These soils shrink and crack when dry and swell and expand when wet. A seasonal high water table is at a depth of 18 to 36 inches from January through March. This soil has poor tilth, and wetness often delays tillage operations. Crops respond well to fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration.

Included with this soil in mapping are a few small areas of Houston and Oktibbeha soils. Also included are a few small areas of soils that have a gravelly surface layer and a few small areas of eroded soils.

This Kipling soil is moderately suited to cultivated crops. Suitable crops include soybeans, grain sorghum, and small grains. Runoff is moderate. Erosion is a severe hazard if this soil is used for cultivated crops. If management practices that include minimum tillage, contour farming, crop rotation, and terracing of the steeper slopes are used, crops that leave a large amount of residue on the surface can be grown year after year. As slope length and gradient increase, conservation treatment should be intensified.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Wetness often limits grazing and use of equipment during the winter and early in the spring. Concerns in management include rotation grazing and weed and brush control.

This soil mainly is used as woodland. Potential productivity is high for commercial wood crops. Suitable trees include cherrybark oak, loblolly pine, Shumard oak, and sweetgum. Seedling mortality and restricted use of equipment are moderate limitations to woodland use and management because of wetness. Planting and harvesting operations should be scheduled during dry periods.

This soil is poorly suited to most urban uses. Wetness and very slow permeability are severe limitations for septic tank absorption fields. These limitations are generally impractical to overcome. An alternate site should be selected in most cases.

High shrink-swell potential is a severe limitation for dwellings and small commercial buildings. Adequately reinforcing foundations can help offset this limitation.

Low strength and very high shrink-swell potential are severe limitations for local roads and streets. Adding suitable subgrade fill material to the roadbed can help offset these limitations.

This Kipling soil is in capability subclass IIIe and in woodland suitability group 2c8.

33—Kirkville fine sandy loam, occasionally flooded. This deep, moderately well drained, level soil is on flood plains in the Coastal Plain. The individual areas are 5 to 100 acres. The slopes are 0 to 1 percent.

Typically, the surface layer is dark grayish brown fine sandy loam about 7 inches thick. The subsoil is yellowish brown fine sandy loam to a depth of about 16 inches; yellowish brown, mottled fine sandy loam to a depth of about 33 inches; light brownish gray, mottled fine sandy loam to a depth of about 65 inches. Below that is mottled gray and yellowish brown sandy loam to a depth of 72 inches.

This soil is moderate in natural fertility and low in organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability is moderate, and the available water capacity is moderate. A seasonal high water table is at a depth of 18 to 30 inches from January through April. This soil has good tilth, but flooding and wetness can delay tillage operations. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

This soil is flooded occasionally from January through April. Flooding generally lasts for 1 to 3 days in winter and early spring. If the soil does not have vegetative cover, fast-moving floodwaters can cause severe erosion of the topsoil.

Included with this soil in mapping are a few small areas of Ozan, Sardis, and Stough soils. Also included are a few narrow areas of water.

This Kirkville soil is well suited to cultivated crops. Suitable crops include soybeans, grain sorghum, and small grains. Occasional flooding can delay planting and tillage operations in the spring. If management practices that include minimum tillage and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

This Kirkville soil mainly is used as woodland. Potential productivity is very high for commercial wood crops. Suitable trees include loblolly pine, eastern cottonwood, cherrybark oak, and sweetgum. This soil has no significant limitations to woodland use and management.

This soil is poorly suited to most urban uses. Flooding and wetness are severe limitations for septic tank absorption fields. Flooding is a severe limitation for dwellings and small commercial buildings and for local roads and streets. Major flood control structures are needed to overcome this limitation.

This Kirkville soil is in capability subgroup IIw and in woodland suitability group 1o7.

34—Leeper silty clay, occasionally flooded. This deep, somewhat poorly drained, level soil is on flood plains in the Blackland Prairie. The individual areas are about 10 to 100 acres. The slopes are 0 to 1 percent.

Typically, the surface layer is dark brown silty clay about 8 inches thick. The subsoil is dark grayish brown, mottled silty clay to a depth of about 35 inches and dark grayish brown, mottled clay to a depth of 45 inches. The underlying material is gray, mottled clay to a depth of 72 inches.

This soil is high in natural fertility and moderate in organic matter content. Reaction ranges from medium acid to moderately alkaline throughout. Permeability is very slow, and the available water capacity is high. This soil shrinks and cracks when dry and swells and expands when wet. A seasonal high water table is at a depth of 12 to 24 inches from January through March. Tilth is difficult to maintain, and wetness often delays tillage operations. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

This soil is flooded occasionally from January through March. Flooding generally lasts from 1 to 3 days. If the soil does not have vegetative cover, fast-moving floodwaters can cause severe erosion of the topsoil.

Included with this soil in mapping are a few small areas of Marietta, Urbo, and Tuscumbia soils. Also included are a few small areas of sandy overwash.

This Leeper soil mainly is used as cropland and is well suited to this use. Suitable crops include soybeans, grain sorghum, and small grains. Occasional flooding and wetness are the main limitations if this soil is used for cultivated crops. Farming operations are often delayed for several days after a rain unless surface drains are installed. The clayey surface layer is very sticky and plastic when wet and very hard when dry. This makes tillage operations difficult. If management practices that include minimum tillage, drainage, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year.

This soil is well suited to pasture or hay crops (fig. 10). Wetness restricts the use of some farm equipment and limits grazing in the winter and early in the spring. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed control.

Potential productivity is very high for commercial wood crops. Suitable trees include eastern cottonwood, sweetgum, green ash, and American sycamore. Because of the clayey surface layer, the use of equipment on this soil and seedling mortality are moderate limitations. The use of equipment limitation is difficult and generally impractical to overcome; however, it can be partly offset by harvesting during the dry periods.

This soil is poorly suited to most urban uses. Flooding, wetness, and very slow permeability are severe limitations for septic tank absorption fields. These limitations are difficult or impractical to overcome. An alternate site should be selected in most cases or an alternate system should be used.

Flooding, wetness, and shrink-swell potential are severe limitations for dwellings and small commercial buildings. These limitations are difficult and generally impractical to overcome. An alternate site should be selected in most cases.

Low strength, flooding, and shrink-swell potential are severe limitations for local roads and streets. Low strength and the shrink-swell potential generally can be overcome by adding suitable subgrade fill material to the roadbed. Major flood control structures are needed to control the flooding limitation.

This Leeper soil is in capability subclass IIw and in woodland suitability group 1w5.

35—Macon fine sandy loam, 3 to 8 percent slopes. This deep, well drained, gently sloping soil is on ridgetops on margins of the Blackland Prairie. The slopes are smooth and convex. The individual areas are about 10 to 50 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 7 inches thick. The subsoil is yellowish red clay loam to a depth of about 26 inches; yellowish red, mottled clay loam to a depth of about 44 inches; strong brown, mottled sandy clay loam to a depth of about 62 inches; and yellowish brown, mottled sandy clay loam to a depth of 72 inches.

This soil is moderate in natural fertility and low in organic matter content. Reaction ranges from medium acid to very strongly acid throughout. Permeability is slow, and the available water capacity is moderate. This soil has good tilth and can be tilled throughout a wide range of moisture content. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Sacul and Oktibbeha soils. Also included are a few small areas of eroded soils.

This Macon soil is moderately suited to cultivated crops. Suitable crops include soybeans, grain sorghum, and small grains. Runoff is medium or rapid. Erosion is a severe hazard if this soil is used for cultivated crops. If management practices that include minimum tillage, contour farming, terracing, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year. As slope length and gradient increase, conservation treatment should be intensified.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

This Macon soil mainly is used as woodland. Potential productivity is moderately high for commercial wood crops. Suitable trees include loblolly pine and shortleaf

Figure 10.—Leeper silty clay, occesionally flooded, is well suited to bahiagrass pasture and hayland. This is one of the higher yielding aoils for bahiagrass.

pine. This soil has no significant limitations to woodland use and management.

This soil is moderately suited to most urban uses. Slow permeability is a severe limitation for septic tank absorption fields. Increasing the size of the absorption field or using a specially designed alternate system can help to alleviate this limitation.

High shrink-swell potential is a moderate limitation for small dwellings and commercial buildings. Adequately reinforcing foundations can help offset this limitation. Slope is a moderate limitation for small commercial buildings. This can be offset by designing dwellings and commercial buildings to conform to the natural contour of the land.

Low strength and high shrink-swell potential are moderate limitations for local roads and streets. Adding suitable fill material to the roadbed can partly offset these limitations.

This Macon soil is in capability subclass IIIe and in woodland suitability group 3o7.

36—Macon fine sandy loam, 8 to 20 percent slopes. This deep, well drained, moderately sloping to moderately steep soil is on hillsides on margins of the Blackland Prairie. The slopes are irregular and convex. The individual areas are about 40 to 200 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 7 inches thick. The subsoil is yellowish red clay loam to a depth of about 26 inches; yellowish red, mottled clay loam to a depth of about 44 inches; strong brown, mottled sandy clay loam to a depth of about 62 inches; and yellowish brown, mottled sandy clay loam to a depth of 72 inches.

This soil is moderate in natural fertility and low in organic matter content. Reaction ranges from medium acid to very strongly acid throughout. Permeability is slow, and the available water capacity is moderate. This soil has good tilth and can be tilled throughout a wide range of moisture content. Pastures respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Sacul and Oktibbeha soils. Also included are a few small areas of eroded soils and a few small areas of soils that have slopes of more than 20 percent.

This Macon soil is not suited to cultivated crops. Moderately steep slopes and rapid runoff are the main limitations. Erosion is a very severe hazard.

This soil is moderately suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include deferred grazing and weed and brush control.

This Macon soil mainly is used as woodland. Potential productivity is moderately high for commercial wood crops. Suitable trees include loblolly pine and shortleaf pine. This soil has no significant limitations to woodland use and management.

These soils are moderately suited to poorly suited to most urban uses. Slow permeability is a severe limitation for septic tank absorption fields. Increasing the size of the absorption field or using a specially designed alternate system can help to alleviate this limitation.

Slope is a moderate limitation for dwellings and a severe limitation for small commercial buildings. High shrink-swell potential is a moderate limitation for dwellings. Designing dwellings and small commercial buildings to conform to the natural contour of the land and adequately reinforcing foundations can help offset these limitations.

Slope, low strength, and high shrink-swell potential are moderate limitations for local roads and streets. Constructing roads and streets on the contour and adding suitable subgrade fill materials to the roadbed can help to minimize these limitations.

This Macon soil is in capability subclass VIe and in woodland suitability group 3o7.

37—Magnet loam, 3 to 8 percent slopes. This moderately deep, well drained, gently sloping soil is on ridgetops and foot slopes in the Magnet Cove areas of the Ouachita Mountains. The individual areas are 50 to 100 acres or more.

Typically, the surface layer is dark reddish brown loam about 8 inches thick. The subsoil is reddish brown clay to a depth of about 23 inches and reddish brown clay loam to a depth of about 31 inches. The underlying material is soft, syenitic saprolite and reddish brown clay loam to a depth of 72 inches.

This soil is high in natural fertility and moderate in organic matter content. Reaction is strongly acid to slightly acid throughout. Permeability is moderately slow, and the available water capacity is low. Crops and grasses respond well to fertilization.

Included with this soil in mapping are a few small areas of soils that are similar to Magnet soil except they have a high content of mica. Also included are a few small areas of eroded soils, a few small areas of soils that have slopes of less than 3 percent, and a few small areas of soils that have a gravelly or stony surface layer.

This Magnet soil is poorly suited to cultivated crops, although grain sorghum and small grains can be grown. Runoff is medium or rapid. Erosion is a very severe hazard if this soil is used for cultivated crops. If management practices that include minimum tillage, contour farming, terracing on steeper slopes, and crop rotation are used, crops can be grown occasionally. A close-growing cover crop should be kept on the soil most of the time.

This soil is moderately suited to pasture. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed control.

Potential productivity is moderate for commercial wood crops. Suitable trees include loblolly pine, shortleaf pine, and black walnut. Magnet soil has no significant limitations to woodland use and management.

This soil is poorly suited for most urban uses. Depth to bedrock and moderately slow permeability are severe limitations for septic tank absorption fields. These limitations are difficult and generally impractical to overcome. Increasing the size of the absorption field, using a specially designed alternate system, or using an alternate site can help to alleviate these limitations.

High shrink-swell potential is a severe limitation for dwellings and small commercial buildings. Adequately reinforcing foundations can help minimize this limitation.

Low strength and high shrink-swell potential are severe limitations for local roads and streets. Adding suitable subgrade fill material to the roadbed can help minimize these limitations.

This Magnet soil is in capability subclass IVe and in woodland suitability group 4o7.

38—Magnet stony loam, 8 to 20 percent slopes. This moderately deep, well drained, moderately sloping to moderately steep soil is on side slopes in the Magnet Cove areas of the Ouachita Mountains. The individual areas are 50 to 100 acres or more.

Typically, the surface layer is dark reddish brown stony loam about 8 inches thick. The subsoil is reddish brown cobbly clay to a depth of about 23 inches and reddish brown cobbly clay loam to a depth of about 31 inches. The underlying material is soft, syenitic saprolite and reddish brown clay loam to a depth of 72 inches.

This soil is high in natural fertility and moderate in organic matter content. Reaction is strongly acid to slightly acid throughout. Permeability is moderately slow, and the available water capacity is low. Grasses respond well to fertilization.

Included with this soil in mapping are a few small areas of soils that are similar to Magnet soil except they have a high content of mica. Also included are a few small areas of eroded soils, a few small areas of soils

that have slopes of less than 8 percent, and a few small areas of soils that have no stones.

This Magnet soil is not suited to cultivated crops or improved pasture. Runoff is rapid. Erosion is a very severe hazard if this soil is used for cultivated crops.

Slope, surface stones, and low available water capacity limit the use of this soil to native pasture and woodland.

Potential productivity is moderate for commercial wood crops. Suitable trees include loblolly pine, shortleaf pine, and black walnut. Because of surface stones, equipment use for woodland use and management is a moderate limitation.

This soil is poorly suited for most urban uses. Depth to bedrock and moderately slow permeability are severe limitations for septic tank absorption fields. These limitations are difficult and generally impractical to overcome. Increasing the size of the absorption field can help to alleviate these limitations. Alternate systems and sites should be selected in most cases.

High shrink-swell potential is a severe limitation for dwellings and small commercial buildings. Adequately reinforcing foundations can help to minimize this limitation. Slope is a severe limitation for small commercial buildings. Designing dwellings and small commercial buildings to conform to the natural contour of the land can help offset this limitation.

Low strength and high shrink-swell potential are severe limitations for local roads and streets. Adding suitable subgrade fill material to the roadbed can help minimize these limitations.

This Magnet soil is in capability subclass VIs and in woodland suitability group 4x8.

39—Magnet stony loam, 20 to 40 percent slopes. This moderately deep, well drained soil is on steep side slopes in the Magnet Cove areas of the Ouachita Mountains. The individual areas are 100 acres or more.

Typically, the surface layer is dark reddish brown stony loam about 8 inches thick. The subsoil is reddish brown cobbly clay to a depth of about 23 inches and reddish brown cobbly clay loam to a depth of about 31 inches. The underlying material is soft, syenitic saprolite and reddish brown clay loam to a depth of 72 inches.

This soil is high in natural fertility and moderate in organic matter content. Reaction is strongly acid to slightly acid throughout. Permeability is moderately slow, and the available water capacity is low.

Included with this soil in mapping are a few small areas of soils that are similar to Magnet soil except they have a high content of mica. Also included are a few small areas of eroded soils; a few small areas of soils that have slopes of less than 20 percent; and a few small areas of soils that have no stones.

This Magnet soil is not suited to cultivated crops or improved pasture. Runoff is rapid. Erosion is a very severe hazard if this soil is used for cultivated crops.

Slope, surface stones, and low available water capacity limit the use of these soils to woodland. Potential productivity is moderate for commercial wood crops. Suitable trees include loblolly pine, shortleaf pine, and black walnut. Restricted use of equipment and seedling mortality are moderate limitations to woodland use and management. Erosion is a moderate hazard.

This soil is poorly suited to most urban uses. Depth to bedrock, moderately slow permeability, and slope are severe limitations for septic tank absorption fields. These limitations are difficult and generally impractical to overcome. Installing distribution lines on the contour and increasing the size of the absorption field can help to alleviate these limitations. Alternate drainage systems should be considered or alternate sites should be selected in most cases.

High shrink-swell potential and slope are severe limitations for dwellings and small commercial buildings. Adequately reinforcing foundations and designing dwelling and small commercial buildings to conform to the natural contour of the land can help offset these limitations.

Low strength, high shrink-swell potential, and slope are severe limitations for local roads and streets. These limitations can be offset by constructing roads and streets on the contour and adding suitable subgrade fill material to the roadbed.

This Magnet soil is in capability subclass VIIs and in woodland suitability group 4x8.

40—Marietta fine sandy loam, occasionally flooded. This deep, moderately well drained, level soil is on flood plains in the Blackland Prairie. The individual areas are 10 to 70 acres. The slopes are 0 to 1 percent.

Typically, the surface layer is brown fine sandy loam about 6 inches thick. The subsurface layer is yellowish brown fine sandy loam to a depth of about 11 inches. The subsoil is dark brown silty clay loam to a depth of about 18 inches; mottled dark brown, yellowish brown, and light brownish gray silty clay loam to a depth of about 22 inches; mottled light brownish gray and yellowish brown loam to a depth of about 36 inches. The underlying material is mottled gray and dark yellowish brown clay loam to a depth of about 58 inches and gray, mottled clay loam to a depth of 72 inches.

This soil is moderate in natural fertility and organic matter content. Reaction ranges from medium acid to mildly alkaline throughout. Permeability is moderate, and the available water capacity is high. A seasonal high water table is at a depth of 18 to 24 inches from January through March. This soil has good tilth, but wetness can delay tillage operations. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

This soil is flooded occasionally from January through March. Flooding generally lasts from 1 to 3 days. If the

soil does not have vegetative cover, fast-moving floodwaters can cause severe erosion of the topsoil.

Included with this soil in mapping are a few small areas of Leeper and Urbo soils. Also included are a few small areas of sandy overwash and a few small areas of soils that are frequently flooded. These soils are adjacent to the stream channel.

This Marietta soil is well suited to cultivated crops. Suitable crops include soybeans, grain sorghum, and small grains. Occasional flooding may delay planting and tillage operations in the spring. If management practices that include minimum tillage and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

This Marietta soil mainly is used as woodland. Potential productivity is very high for commercial wood crops. Suitable trees include American sycamore, eastern cottonwood, green ash, and sweetgum. This soil has no significant limitations to woodland use and management.

This soil is poorly suited to most urban uses. Flooding and wetness are severe limitations for septic tank absorption fields. Flooding is a severe limitation for dwellings and small commercial buildings and for local roads and streets. Major flood control structures are needed to overcome the flooding limitation for urban use.

This Marietta soil is in capability subgroup IIw and in woodland suitability group 1o7.

41—Mayhew silty clay loam, 0 to 2 percent slopes. This deep, poorly drained, level to nearly level soil is on upland flats in the Coastal Plain. The slopes are smooth and convex to slightly depressional. The individual areas are 20 to 100 acres.

Typically, the surface layer is dark grayish brown silty clay loam about 3 inches thick. The subsoil is gray, mottled silty clay to a depth of about 38 inches and light brownish gray, mottled silty clay to a depth of about 63 inches. The underlying material is olive yellow platy, clayey shale to a depth of 72 inches.

This soil is low in natural fertility and organic matter content. Reaction is medium to very strongly acid throughout. Permeability is very slow, and the available water capacity is high. A seasonal high water table is within a depth of 12 inches from January through March. This soil has poor tilth, and wetness often delays tillage operations. Crops respond well to fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration.

Included with this soil in mapping are a few small areas of Eutaw, Kipling, Wilcox, and Sacul soils. Also included are a few small areas of soils that have a silt loam surface layer.

This Mayhew soil is moderately suited to cultivated crops. Suitable crops include rice, soybeans, grain sorghum, and small grains. Runoff is slow or medium. Wetness often delays tillage operations. If management practices that include minimum tillage, drainage, contour farming, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year.

This soil is well suited to pasture or hayland. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Excessive wetness often limits grazing and the use of farm equipment during the winter and early in the spring. Grazing when the soil is saturated causes sod damage and surface compaction. Concerns in management include rotation grazing and weed and brush control.

This soil mainly is used as woodland. Potential productivity is high for commercial wood crops. Suitable trees include loblolly pine and sweetgum. Wetness and the clayey subsoil are severe limitations for equipment use in woodland use and management. Harvesting operations should be scheduled during dry periods. Seedling mortality is a moderate limitation because of wetness. Planting on a raised seedbed helps minimize this limitation.

This soil is poorly suited to most urban uses. Wetness and very slow permeability are severe limitations for septic tank absorption fields. Increasing the size of the absorption field, using a specially designed alternate system, and installing a drainage system around the perimeter can help offset these limitations.

Wetness and shrink-swell potential are severe limitations for dwellings and small commercial buildings. Installing surface diversions and a subsurface drainage system can help offset the wetness limitation. Adequately reinforcing foundations with steel can help minimize the high shrink-swell potential limitation.

Low strength, wetness, and high shrink-swell potential are severe limitations for local roads and streets. These limitations can be offset by constructing local roads and streets on a raised suitable subgrade fill material.

This Mayhew soil is in capability subclass IIIw and in woodland suitability group 2w9.

42—McLaurin loamy fine sand, 1 to 3 percent slopes. This deep, well drained, nearly level soil is on ridgetops in the Coastal Plain. The slopes are smooth and convex. The individual areas are about 10 to 50 acres.

Typically, the surface layer is brown loamy fine sand about 9 inches thick. The subsurface layer is brownish yellow fine sandy loam to a depth of about 15 inches. The subsoil is yellowish red fine sandy loam to a depth of about 25 inches; yellowish red sandy loam to a depth

of about 66 inches; and yellowish red, mottled sandy loam to a depth of about 72 inches.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is moderate, and the available water capacity is moderate. This soil has good tilth and can be tilled throughout a wide range of moisture content. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Darden, Smithdale, and Sacul soils. Also included are a few small areas of soils that have slopes of more than 3 percent and a few small areas of eroded soils.

This McLaurin soil is well suited to cultivated crops. Suitable crops include soybeans, grain sorghum, small grains, and vegetable crops. Runoff is slow or medium. Erosion is a slight to moderate hazard if this soil is used for cultivated crops. If management practices that include minimum tillage, contour farming, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year. As slope length and gradient increase, conservation treatment should be intensified.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include deferred grazing and weed and brush control.

This McLaurin soil mainly is used as woodland. Potential productivity is moderately high for commercial wood crops. Suitable trees include loblolly pine and shortleaf pine. This soil has no significant limitations to woodland use and management.

This soil is well suited to most urban uses. Moderate permeability is a moderate limitation for septic tank absorption fields. Increasing the size of the absorption field can help offset this limitation. This soil has no significant limitations for dwellings or small commercial buildings or for local roads and streets.

This McLaurin soil is in capability subclass IIs and in woodland suitability group 3o1.

43—Nugent loamy fine sand, frequently flooded. This deep, excessively drained, level soil is on flood plains in the Coastal Plain and in transitional areas to the Ouachita Mountains. Areas of this soil are oxbow shaped and generally occur as natural levees. The individual areas are about 5 to 40 acres. The slopes are 0 to 1 percent.

Typically, the surface layer is dark grayish brown loamy fine sand about 5 inches thick. The underlying material is yellowish brown loamy sand to a depth of about 12 inches; dark yellowish brown loamy sand to a depth of about 26 inches; yellowish brown loamy fine sand to a depth of about 45 inches; yellowish brown loamy sand to a depth of 58 inches; and yellowish brown loamy fine sand to a depth of 72 inches.

This soil is low in natural fertility and organic matter content. Reaction is very strongly acid to slightly acid throughout. Permeability is moderately rapid, and the available water capacity is low. A seasonal water table is within a depth of 42 inches during the winter and the spring. Crops respond well to fertilization. This soil has good tilth and can be tilled throughout a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

This soil is flooded frequently for brief to long periods from December through April. If the soil does not have a vegetative cover, fast-moving floodwaters can cause severe damage in a short time.

Included with this soil in mapping are a few small areas of Ochlockonee, Toine, and Ouachita soils. Also included are a few small areas of gravelly overwash.

This Nugent soil is not suited to cultivated crops. Frequent flooding is the main limitation. A major flood control system is needed to overcome this limitation.

This soil is poorly suited to pasture or hayland. Suitable plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include deferred grazing and weed and brush control.

This soil mainly is used as woodland. Potential productivity is high for commercial wood crops. Suitable trees include loblolly pine, sweetgum, and water oak. Restricted use of equipment and seedling mortality are moderate limitations to woodland use and management.

This soil is poorly suited to most urban uses. Flooding and wetness are severe limitations for septic tank absorption fields. Flooding is a severe limitation for dwellings and small commercial buildings and for local roads and streets. Major flood control structures are needed to overcome this limitation.

This Nugent soil is in capability subclass Vw and in woodland suitability group 2s8.

44—Ochlockonee fine sandy loam, occasionally flooded. This deep, well drained, level soil is on flood plains in the Coastal Plain and on margins of the Ouachita Mountains. Areas of this soil parallel major streams. The individual areas are about 10 to 100 acres. The slopes are 0 to 1 percent.

Typically, the surface layer is brown fine sandy loam about 6 inches thick. The subsurface layer is yellowish brown fine sandy loam to a depth of about 12 inches. The underlying material is dark brown fine sandy loam to a depth of about 35 inches; dark brown, mottled fine sandy loam to a depth of about 44 inches; and pale brown, mottled loamy sand to a depth of 72 inches.

This soil is moderate in natural fertility and low in organic matter content. Reaction is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is moderately rapid, and

the available water capacity is moderate. A seasonal water table is at a depth of 36 inches during the winter and the spring. Crops respond well to fertilization. This soil has good tilth and can be tilled throughout a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

This soil is flooded occasionally for very brief periods from December through April. If the soil does not have a vegetative cover, fast-moving floodwaters can cause severe damage in a short time.

Included with this soil in mapping are a few small areas of Nugent, Iuka, and Ouachita soils. Also included are many floodwater relief channels and also a few areas of eroded soils that were scoured by floodwater.

This Ochlockonee soil is well suited to cultivated crops. Suitable crops include soybeans, grain sorghum, and small grains. Occasional flooding is the main limitation. If management practices that include minimum tillage and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year.

This soil is well suited to pasture or hayland. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

This Ochlockonee soil mainly is used as woodland. Potential productivity is very high for commercial wood crops. Suitable trees include loblolly pine and eastern cottonwood. This soil has no significant limitations to woodland use and management.

This soil is poorly suited to most urban uses. Wetness and flooding are severe limitations for septic tank absorption fields. Flooding is a severe limitation for dwellings and small commercial buildings and for local roads and streets. Major flood control structures are needed to overcome the flooding limitation.

This Ochlockonee soil is in capability subclass IIw and in woodland suitability group 1o7.

45—Oktibbeha fine sandy loam, 3 to 8 percent slopes, eroded. This moderately deep to deep, moderately well drained, gently sloping soil is on eroded ridgetops and side slopes in the Blackland Prairie. The individual areas are about 15 to 85 acres.

Typically, the surface layer is brown fine sandy loam about 3 inches thick. The subsoil is yellowish red, mottled clay to a depth of about 32 inches; and mottled yellowish brown and light brownish gray clay to a depth of about 43 inches. The underlying material is mottled light olive brown and yellowish brown clay to a depth of about 49 inches. Below that is soft, platy, light olive brown chalk that can be cut with a spade.

This soil is moderate in natural fertility and low in organic matter content. Reaction ranges from very strongly acid to slightly acid in the surface layer and in the subsoil. The underlying material ranges from neutral to moderately alkaline. Permeability is very slow, and the available water capacity is moderate. This soil shrinks and cracks when dry and swells and expands when wet. It has fair tilth and can be tilled only within a narrow range of moisture content. Erosion has removed most of the topsoil, and a few rills occur. Crops respond well to fertilization. The root zone is moderately deep, and the clayey subsoil can restrict root penetration.

Included with this soil in mapping are a few small areas of Sumter, Kipling, Demopolis, and Macon soils. Also included are some soils in a few small gullied areas.

This Oktibbeha soil is poorly suited to cultivated crops, although grains and grain sorghum can be grown. Erosion has removed most of the topsoil, and a few rills have occurred. Runoff is rapid. Erosion is a very severe hazard if this soil is used for cultivated crops. If management practices that include minimum tillage, contour farming, terracing, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown occasionally. A close-growing cover crop should be kept on the soil most of the time. As slope length and gradient increase, conservation treatment should be intensified.

This soil mainly is used as pasture and is moderately suited to this use. Suitable pasture plants are bermudagrass and bahiagrass. Concerns in management include rotation grazing, erosion control, and weed and brush control.

Potential productivity is moderately high for commercial wood crops. Suitable trees include loblolly pine and eastern redcedar. When wet, the clayey subsoil is a moderate limitation to use of equipment for woodland use and management. This limitation can be offset by using equipment during dry periods whenever possible.

This soil is poorly suited to most urban uses. Very slow permeability is a severe limitation for septic tank absorption fields. This limitation is difficult and generally impractical to overcome. Increasing the size of the absorption field or using a specially designed alternate system can help to alleviate this limitation.

High shrink-swell potential is a severe limitation for dwellings and small commercial buildings. Adequately reinforcing foundations can help offset this limitation.

Low strength and high shrink-swell potential are severe limitations for local roads and streets. Adding suitable fill material to the roadbed can help offset these limitations.

This Oktibbeha soil is in capability subclass IVe and in woodland suitability group 3c8.

46—Oktibbeha fine sandy loam, 8 to 12 percent slopes, eroded. This moderately deep to deep, moderately well drained, moderately sloping soil is on eroded side slopes in the Blackland Prairie. The individual areas are about 10 to 60 acres.

Typically, the surface layer is brown fine sandy loam about 3 inches thick. The subsoil is yellowish red, mottled clay to a depth of about 32 inches and mottled yellowish brown and light brownish gray clay to a depth of about 43 inches. The underlying material is mottled light olive brown and yellowish brown clay to a depth of about 49 inches. Below that is soft, platy, light olive brown chalk that can be cut with a spade.

This soil is moderate in natural fertility and low in organic matter content. Reaction ranges from very strongly acid to slightly acid in the surface layer and in the subsoil. The underlying material ranges from neutral to moderately alkaline. Permeability is very slow, and the available water capacity is moderate. This soil shrinks and cracks when dry and swells and expands when wet. This soil has fair tilth and can be tilled only within a narrow range of moisture content. Erosion has removed most of the topsoil, and a few rills occur. Pastures respond well to fertilization. The root zone is moderately deep, and the clayey subsoil can restrict root penetration.

Included with this soil in mapping are a few small areas of Sumter, Demopolis, Macon, and Kipling soils. Also included are some soils in a few small gullied areas, and a few small areas of soils that have slopes of more than 12 percent.

This Oktibbeha soil is not suited to cultivated crops. Erosion has removed most of the topsoil, and a few rills have occurred. Runoff is rapid. Erosion is a very severe hazard if this soil is used for cultivated crops.

This soil mainly is used as pasture, and it is moderately suited to pasture or hayland (fig. 11). Suitable pasture plants are bermudagrass and bahiagrass. Concerns in management include erosion control, rotation grazing, and weed and brush control.

Potential productivity is moderately high for commercial wood crops. Suitable trees include loblolly pine and eastern redcedar. When wet, the clayey subsoil is a moderate limitation to use of equipment for woodland use and management. This limitation can be offset by using equipment during dry periods whenever possible.

Figure 11.—Most of Oktibbeha fine sandy loam, 8 to 12 percent slopes, eroded, is used as pasture. Permanent vegetation is needed to control erosion on this soil.

The soil is poorly suited to most urban uses. Very slow permeability is a severe limitation for septic tank absorption fields. This limitation is difficult and generally impractical to overcome. Increasing the size of the absorption field or using a specially designed alternate system can help alleviate this limitation.

High shrink-swell potential and slope are severe limitations for dwellings and small commercial buildings. Adequately reinforcing foundations and designing dwellings and small commercial buildings to conform to the natural contour of the land can help offset these limitations.

High shrink-swell potential and low strength are severe limitations for local roads and streets. Adding suitable subgrade fill material to the roadbed can help offset these limitations.

This Oktibbeha soil is in capability subclass VIe and in woodland suitability group 3c8.

47—Ora fine sandy loam, 3 to 8 percent slopes. This deep, moderately well drained, gently sloping soil is on upland side slopes in the Coastal Plain. The slopes are smooth and convex. The individual areas are about 5 to 80 acres.

Typically, the surface layer is brown fine sandy loam about 4 inches thick. The subsurface layer is yellowish brown loam to a depth of about 8 inches. The subsoil is yellowish red clay loam to a depth of about 29 inches. Below that is a dense, compact and brittle fragipan that is mottled red, yellowish brown, and light brownish gray loam to a depth of about 41 inches; and mottled red, brownish yellow, and gray loam to a depth of 72 inches.

This soil is low in natural fertility and organic matter content. Reaction ranges from strongly acid to extremely acid except where the surface layers has been limed. Permeability is moderate above the fragipan and moderately slow in the fragipan. The available water capacity is moderate. A perched water table is at a depth of 24 to 42 inches from late in the winter through spring. This soil has good tilth and can be tilled throughout a wide range of moisture content. The fragipan restricts root penetration and slows the downward movement of water.

Included with this soil in mapping are a few small areas of Bowie, Savannah, and Sacul soils. Also included are a few small areas of eroded soils.

This Ora soil is moderately suited to cultivated crops. Suitable crops include grain sorghum, small grains, and vegetable crops. Runoff is medium or rapid. Erosion is a severe hazard if this soil is used for cultivated crops. If management practices that include minimum tillage, contour farming, terracing, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year. As slope length and gradient increase, conservation treatment should be intensified.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

This Ora soil mainly is used as woodland. Potential productivity is moderately high for commercial wood crops. Suitable trees include loblolly pine and shortleaf pine. This soil has no significant limitations to woodland use and management.

This soil is moderately suited to most urban uses. Moderately slow permeability and wetness are severe limitations for septic tank absorption fields. Increasing the size of the absorption field, using a specially designed alternate system, or installing a drainage system around the perimeter can help offset these limitations.

Wetness is a moderate limitation for dwellings. Wetness and slope are moderate limitations for small commercial buildings. Surface diversions and subsurface drainage systems can help offset the wetness limitation. Designing dwelling and small commercial buildings to conform to the natural contour of the land can help offset the slope limitation.

Low strength and wetness are moderate limitations for local roads and streets. Constructing roads and streets on raised suitable subgrade fill material can help offset these limitations.

This Ora soil is in capability subclass IIIe and in woodland suitability group 3o7.

48—Ouachita silt loam, 0 to 3 percent slopes. This deep, well drained, level to nearly level soil is on high flood plains and low terraces in the Coastal Plain. This soil is rarely flooded. The individual areas are 5 to 50 acres.

Typically, the surface layer is dark grayish brown silt loam about 6 inches thick. The subsoil is dark brown silty clay loam to a depth of about 11 inches; dark yellowish brown, mottled silty clay loam to a depth of about 40 inches; yellowish brown, mottled silty clay loam to a depth of about 59 inches; and dark yellowish brown, mottled silty clay loam to a depth of 72 inches.

This soil is moderate in natural fertility and low in organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability is moderately slow, and the available water capacity is high. This soil has good tilth and can be tilled throughout a wide range of moisture content. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Sardis and Cahaba soils.

This Ouachita soil is well suited to cultivated crops. Suitable crops include soybeans, grain sorghum, corn, and small grains. Runoff is slow or medium. Erosion is a slight to moderate hazard if this soil is used for cultivated

crops. If management practices that include minimum tillage and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year.

This soil mainly is used as pasture or hayland, and it is well suited to these uses. Suitable pasture plants are alfalfa, bermudagrass, bahiagrass, tall fescue, and white clover. Concerns in management include rotation grazing and weed control.

Potential productivity is very high for commercial wood crops. Suitable trees include loblolly pine, sweetgum, Nuttall oak, American sycamore and eastern cottonwood. This soil has no significant limitations to woodland use and management.

This soil is poorly suited to most urban uses. Moderately slow permeability is a severe limitation for septic tank absorption fields. This limitation is difficult to overcome. Increasing the size of the absorption field or using a specially designed alternate system can help offset this limitation.

Flooding is a severe limitation for dwellings and small commercial buildings. Major flood control structures are needed to overcome this limitation.

Low strength is a severe limitation for local roads and streets. Adding suitable subgrade fill material to the roadbed can help offset this limitation.

This Ouachita soil is in capability subclass IIe and in woodland suitability group 1o7.

49—Ouachita silt loam, occasionally flooded. This deep, well drained, level to nearly level soil is on flood plains in the Coastal Plain. The individual areas are 10 to 100 acres. The slopes are 0 to 1 percent.

Typically, the surface layer is dark grayish brown silt loam about 6 inches thick. The subsoil is dark brown silty clay loam to a depth of about 11 inches; dark yellowish brown, mottled silty clay loam to a depth of about 40 inches; yellowish brown, mottled silty clay loam to a depth of about 59 inches; and dark yellowish brown, mottled silty clay loam to a depth of 72 inches.

This soil is moderate in natural fertility and low in organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability is moderately slow, and the available water capacity is high. This soil has good tilth and can be tilled throughout a wide range of moisture content. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

This soil is occasionally flooded for long to very long periods from December through May. Flooding generally lasts from 1 to 3 days. If the soil does not have a vegetative cover, fast-moving floodwaters can cause severe erosion of the topsoil.

Included with this soil in mapping are a few small areas of Ochlockonee, Iuka, and Sardis soils. Also included are a few small areas of sandy and gravelly overwash.

This Ouachita soil is well suited to cultivated crops. Suitable crops include corn, soybeans, grain sorghum, and small grains. Occasional flooding is the main limitation. If management practices that include minimum tillage and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

This Ouachita soil mainly is used as woodland. Potential productivity is very high for commercial wood crops. Suitable trees include loblolly pine, sweetgum, Nuttall oak, American sycamore, and eastern cottonwood. This soil has no significant limitations to woodland use and management.

This soil is poorly suited to most urban uses. Flooding and moderately slow permeability are severe limitations for septic tank absorption fields. These limitations are difficult and generally impractical to overcome. Enlarging absorption field or using a specially designed alternate system can help offset these limitations.

Flooding is a severe limitation for dwellings and small commercial buildings. Flooding and low strength are severe limitations for local roads and streets. Adding suitable fill material to the roadbed can help offset the low strength limitation. Major flood control structures are needed to overcome the flooding limitation.

This Ouachita soil is in capability subclass IIw and in woodland suitability group 1o7.

50—Ozan fine sandy loam, occasionally flooded. This deep, poorly drained, level soil is on flood plains and low stream terraces in the Coastal Plain. The individual areas are about 50 to 80 acres. The slopes are 0 to 1 percent.

Typically, the surface layer is light brownish gray, mottled fine sandy loam about 7 inches thick. The subsurface layer is gray, mottled fine sandy loam to a depth of about 17 inches. The subsoil is light brownish gray, mottled loam, to a depth of about 39 inches; gray, mottled sandy clay loam to a depth of about 53 inches; and gray mottled sandy clay loam to a depth of 72 inches.

This soil is moderate in natural fertility and low in organic matter content. Reaction ranges from medium acid to very strongly acid throughout. Permeability is slow, and the available water capacity is high. A seasonal high water table is at a depth of 12 to 30 inches during the winter and the spring. Water ponds in the depressional areas of this soil. Wetness often delays tillage operations. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

This soil is flooded occasionally for very brief to brief periods from December through May. If this soil doesn't

have a vegetative cover, fast-moving floodwater can cause severe erosion of the topsoil in a short time.

Included with this soil in mapping are a few small areas of Toine, Kirkville, and Iuka soils. Also included are a few, small, sandy areas that occur as rounded mounds.

This Ozan soil is poorly suited to cultivated crops, although grain sorghum, small grains, and soybeans can be grown. Wetness, occasional flooding, and a seasonal high water table are the main limitations. Tillage operations are often delayed for several days after a rain if an adequate drainage system has not been installed. Erosion is a slight hazard if this soil is used for cultivated crops. If management practices that include minimum tillage and drainage are used, crops that leave a large amount of residue on the surface can be grown year after year. Crops that leave a large amount of surface residue reduce surface crusting, increase organic matter, and improve tilth.

This soil is moderately suited to pasture and hay crops. Suitable pasture plants include tall fescue, white clover, bermudagrass, bahiagrass, and lespedeza. Wetness restricts the use of some farm equipment and limits grazing in the winter and early in the spring. Grazing when the soil is saturated causes sod damage and surface compaction. Other concerns in management include deferred grazing, rotation grazing, and weed control.

This soil mainly is used as woodland. Potential productivity is high for commercial wood crops. Suitable trees include loblolly pine and sweetgum. Seedling mortality is a moderate limitation and the restricted use of equipment because of wetness is a severe limitation to woodland use and management. Seedling mortality can be partly overcome by planting on a raised seedbed. Logging operations that require the use of heavy equipment should be confined to the summer and the fall.

This soil is poorly suited to most urban uses. Slow permeability, flooding, and wetness are severe limitations for septic tank absorption fields. These limitations are difficult and often impractical to overcome. Increasing the size of the absorption field and installing a subsurface drainage system around the perimeter can partly overcome these limitations.

Flooding and wetness are severe limitations for dwellings and small commercial buildings. Surface diversions and a subsurface drainage system can partly alleviate the wetness limitation.

Flooding also is a severe limitation for local roads and streets. Constructing roads and streets on raised suitable subgrade fill material can help offset this limitation.

Major flood control structures are necessary to overcome the flooding limitation for urban uses.

This Ozan soil is in capability subclass IVw and in woodland suitability group 2w9.

51—Pikeville fine sandy loam, 1 to 3 percent slopes. This deep, well drained, nearly level soil is on hilltops in the Coastal Plain. The slopes are smooth and convex. The individual areas are about 10 to 100 acres.

Typically, the surface layer is dark brown fine sandy loam about 4 inches thick. The subsoil is yellowish red loam to a depth of about 11 inches; red loam to a depth of about 46 inches; and red extremely gravelly loam to a depth of 72 inches.

This soil is low in natural fertility and organic matter content. Reaction ranges from strongly acid to very strongly acid throughout. Permeability is moderate, and the available water capacity is moderate. This soil has good tilth and can be tilled throughout a wide range of moisture content. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Saffell, Savannah, and Smithdale soils. Also included are a few small areas of soils that have a gravelly surface layer.

This Pikeville soil is well suited to cultivated crops. Suitable crops include grain sorghum, truck crops, and small grains. This soil also is suitable for orchards. Runoff is medium. Erosion is a moderate hazard if this soil is used for cultivated crops. If management practices that include minimum tillage, contour farming, and terracing are used, crops that leave a large amount of residue on the surface can be grown year after year. As slope length and gradient increase, conservation treatment should be intensified.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

This Pikeville soil mainly is used as woodland. Potential productivity is moderately high for commercial wood crops. Suitable trees include loblolly pine and shortleaf pine. This soil has no significant limitations to woodland use and management.

This soil is well suited to most urban uses. It has no significant limitations to most urban uses.

This Pikeville soil is in capability subclass IIe and in woodland suitability group 3o1.

52—Pikeville fine sandy loam, 3 to 8 percent slopes. This deep, well drained, gently sloping soil is on hilltops in the Coastal Plain. The slopes are smooth and convex. The individual areas are about 5 to 80 acres.

Typically, the surface layer is dark brown fine sandy loam about 4 inches thick. The subsoil is yellowish red loam to a depth of about 11 inches; red gravelly loam to a depth of about 46 inches; and red extremely gravelly loam to a depth of 72 inches or more.

This soil is low in natural fertility and organic matter content. Reaction ranges from strongly acid to very strongly acid throughout. Permeability is moderate, and

the available water capacity is moderate. This soil has good tilth and can be tilled throughout a wide range of moisture content. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Saffell, Savannah, Sacul, and Smithdale soils. Also included are a few small areas of soils that have a gravelly surface layer.

This Pikeville soil is moderately suited to cultivated crops. Suitable crops include grain sorghum, truck crops, and small grains. This soil also is suitable for orchards. Runoff is medium or rapid. Erosion is a severe hazard if this soil is used for cultivated crops. If management practices that include minimum tillage, contour farming, terracing, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year. As slope length and gradient increase, conservation treatment should be intensified.

This soil is well suited to pasture or hay crops. Suitable pasture plants are fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

This Pikeville soil mainly is used as woodland. Potential productivity is moderately high for commercial wood crops. Suitable trees include loblolly pine and shortleaf pine. This soil has no significant limitations to woodland use and management.

This soil is well suited to most urban uses. It has no significant limitations to use as septic tank absorption fields, as sites for dwellings, or for local roads and streets. Slope is a moderate limitation for small commercial buildings. Possible methods of overcoming this limitation include designing structures that conform to the natural contour.

This Pikeville soil is in capability subclass IIIe and in woodland suitability group 3o1.

53—Pirum fine sandy loam, 3 to 8 percent slopes. This moderately deep, well drained, gently sloping soil is on ridgetops and lower side slopes in the Ouachita Mountains. The slopes are smooth and convex. The individual areas are about 10 to 80 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 5 inches thick. The subsoil is brownish yellow fine sandy loam to a depth of about 10 inches and yellowish brown loam to a depth of about 42 inches. Below that is hard, tilted and fractured sandstone bedrock that has lenses of shale.

This soil is low in natural fertility and organic matter content. Reaction ranges from medium acid to very strongly acid throughout. Permeability is moderate, and the available water capacity is moderate. This soil has good tilth and can be tilled throughout a wide range of moisture content. Crops respond well to fertilization. The root zone is moderately deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Sherwood, Sherless, and Shermore soils. Also included are a few small areas of eroded soils and a few small areas of soils that have a stony surface layer.

This Pirum soil is moderately suited to cultivated crops. Suitable crops include corn, grain sorghum, and small grain. Runoff is medium or rapid. Erosion is a severe hazard if this soil is used for cultivated crops. If management practices that include minimum tillage, contour farming, terracing on the steeper slopes, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year. As slope length and gradient increase, conservation treatment should be intensified.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

This Pirum soil mainly is used as woodland. Potential productivity is moderately high for commercial wood crops. Suitable trees include loblolly pine, shortleaf pine, and southern red oak. This soil has no significant limitations to woodland use and management.

This soil is moderately suited to most urban uses. Depth to bedrock is a severe limitation for septic tank absorption fields. This limitation is difficult and generally impractical to overcome. An alternate site should be selected in most cases, or an alternate system should be used.

Depth to bedrock is a moderate limitation for dwellings and for local roads and streets. Building structures above the bedrock and adding fill material when landscaping the area can help offset this limitation for dwellings. Slope and depth to bedrock are moderate limitations for small commercial buildings. Building structures above the bedrock, adding fill material when landscaping the area, and designing small commercial buildings to conform to the natural contour of the land can help alleviate these limitations. Depth to bedrock limitation can require special planning as to proper location for streets and roads and proper grading of the site to avoid the unnecessary removal of rock.

This Pirum soil is capability subclass IIIe and in woodland suitability group 3o7.

54—Pirum-Sherless-Shermore fine sandy loams, 3 to 8 percent slopes. This map unit consists of moderately deep and deep, well drained and moderately well drained, gently sloping soils on ridgetops in the Ouachita Mountains. Areas of these soils are so intricately mixed or so small that it was not practical to separate them at the scale for mapping. Mapped areas range from about 50 to 500 acres or more. The individual areas are about 5 to 50 acres.

The moderately deep to deep, well drained, Pirum soil makes up about 35 percent of the map unit. Typically,

the surface layer is dark grayish brown fine sandy loam about 5 inches thick. The subsoil is brownish yellow fine sandy loam to a depth of about 10 inches and yellowish brown loam to a depth of about 42 inches. Below that is hard, tilted and fractured sandstone bedrock that has lenses of shale.

Pirum soil is low in natural fertility and organic matter content. Reaction ranges from medium acid to very strongly acid throughout. Permeability is moderate, and the available water capacity is moderate. Crops respond well to fertilization. This soil has good tilth and can be tilled throughout a wide range of moisture content. The root zone is moderately deep and is easily penetrated by plant roots.

The moderately deep, well drained, Sherless soil makes up about 30 percent of the map unit. Typically, the surface layer is dark grayish brown fine sandy loam about 5 inches thick. The subsurface layer is light yellowish brown fine sandy loam to a depth of about 14 inches. The subsoil is yellowish red clay loam to a depth of about 31 inches. Below that is soft, tilted and fractured sandstone bedrock that has intrusions of shale.

Sherless soil is low in natural fertility and organic matter content. Reaction is very strongly acid to slightly acid in the surface layer, very strongly acid to medium acid in the subsurface layer, and very strongly acid or strongly acid in the subsoil. Permeability is moderate, and the available water capacity is moderate. Crops respond well to fertilization. This soil has good tilth and can be worked throughout a wide range of moisture content. The root zone is moderately deep and is easily penetrated by plant roots.

The deep, moderately well drained Shermore soil makes up about 20 percent of the map unit. Typically, the surface layer is dark brown fine sandy loam about 4 inches thick. The subsoil is yellowish brown loam to a depth of about 20 inches; strong brown, mottled, compact and brittle clay loam to a depth of about 49 inches; and mottled gray and strong brown clay loam to a depth of about 71 inches. Below that is tilted and fractured shale bedrock that has lenses of shale.

Shermore soil is low in natural fertility and organic matter content. Reaction ranges from strongly acid to slightly acid in the surface layer and subsurface layer. It ranges from very strongly acid to slightly acid in the upper part of the subsoil and from very strongly acid to medium acid in the middle and lower parts. Permeability is moderate, and the available water capacity is moderate. This soil has a seasonal high water table at a depth of 18 to 42 inches during winter and spring. Crops respond well to fertilization. This soil has good tilth, but wetness can occasionally delay tillage operations. The compact and brittle subsoil restricts root penetration.

Included in mapping are small areas of Carnasaw, Clebit, and Bonnerdale soils. These included soils make up 15 percent of the map unit.

The soils in this map unit are poorly suited to cultivated crops. However, grain sorghum and small grains can be grown. Runoff is rapid. Erosion is a very severe hazard if these soils are used for cultivated crops. If management practices that include minimum tillage, contour farming, terracing the steeper slopes, and rotating crops are used, crops that leave a large amount of residue can be grown occasionally. A close-growing cover crop should be kept on the soil most of the time. As slope length and gradient increase, conservation treatment should be intensified.

The soils in this map unit are well suited to pasture. Suitable pasture plants are bermudagrass, bahiagrass, clover, lespedeza, and tall fescue. Concerns in management include deferred grazing and weed and brush control.

The soils in this map unit mainly are used as woodland. Potential productivity is moderately high for commercial wood crops. Suitable trees include loblolly pine, shortleaf pine, and southern red oak. The soils in this map unit have no significant limitations to woodland use or management.

Pirum, Sherless, and Shermore soils are moderately suited to most urban uses.

On Pirum soil, depth to bedrock is a severe limitation for septic tank absorption fields. Depth to bedrock is a moderate limitation for dwellings and for local roads and streets. Slope and depth to bedrock are moderate limitations for small commercial buildings.

On Sherless soil, depth to bedrock is a severe limitation for septic tank absorption fields. This soil has no significant limitations for dwellings and local roads and streets. Slope is a moderate limitation for small commercial buildings.

On Shermore soil, moderately slow permeability and wetness are severe limitations for septic tank absorption fields. Wetness is a moderate limitation for dwellings and for local roads and streets. Wetness and slope are moderate limitations for small commercial buildings.

On the soils in this map unit, depth to bedrock limitations are difficult and generally impractical to overcome. In most cases, an alternate site should be selected. Slope limitations for small commercial buildings are difficult to overcome and often require extensive cut and fill operations. Designing structures to conform to the natural contour of the land can help offset this limitation.

The wetness limitation for dwellings and small commercial buildings can be partly offset by installing surface diversions and subsurface drainage systems around the foundation. The wetness limitation for local roads and streets can be offset by installing surface diversions and drainage systems and constructing roads on raised fill material.

Permeability and wetness limitations for septic tank absorption fields also are difficult to overcome. An alternate site is often the best solution. These limitations

can be partly offset by increasing the size of the absorption field, installing a subsurface drainage system around the perimeter, or using a specially designed alternate system.

The soils in this map unit are in capability subclass IVe and in woodland suitability group 3o7.

55—Pirum-Zafra-Clebit complex, 3 to 8 percent slopes. This map unit consists of deep, moderately deep, and shallow, well drained, gently sloping soils on ridgetops in the Ouachita Mountains. Areas of these soils are so intricately mixed or so small that it was not practical to separate them at the scale selected for mapping. Mapped areas range from about 100 to 500 acres. The individual areas are about 5 to 50 acres.

The moderately deep to deep Pirum soil makes up about 35 percent of the map unit. Typically, the surface layer is dark grayish brown fine sandy loam about 5 inches thick. The subsoil is brownish yellow fine sandy loam to a depth of about 10 inches and yellowish brown loam to a depth of about 42 inches. Below that is hard, tilted and fractured sandstone bedrock that has lenses of shale.

Pirum soil is low in natural fertility and organic matter content. Reaction ranges from medium acid to very strongly acid throughout. Permeability is moderate, and the available water capacity is moderate. Crops respond well to fertilization. This soil has good tilth and can be tilled throughout a wide range of moisture conditions. The root zone is moderately deep and is easily penetrated by plant roots.

The deep to moderately deep Zafra soil makes up about 30 percent of the map unit. Typically, the surface layer is dark grayish brown stony fine sandy loam about 5 inches thick. The subsurface layer is yellowish brown very gravelly fine sandy loam to a depth of about 9 inches. The subsoil is yellowish brown very gravelly loam to a depth of about 12 inches and yellowish red very gravelly sandy clay loam to a depth of about 31 inches. Below that is soft, tilted and fractured sandstone bedrock that has lenses of shale to a depth of about 33 inches underlain by hard, tilted and fractured sandstone bedrock that has lenses of shale.

Zafra soil is low in natural fertility and organic matter content. Reaction is medium acid or strongly acid in the surface and subsurface layers and is very strongly acid in the subsoil. Permeability is moderate, and the available water capacity is low. Crops respond well to fertilization. This soil has good tilth and can be tilled throughout a wide range of moisture content. The root zone is moderately deep and is easily penetrated by plant roots.

The shallow Clebit soil makes up about 15 percent of the map unit. Typically, the surface layer is dark grayish brown stony fine sandy loam about 6 inches thick. The subsoil is yellowish brown very gravelly fine sandy loam to a depth of about 17 inches. Below that is hard, tilted and fractured sandstone bedrock.

Clebit soil is low in natural fertility and organic matter content. Reaction ranges from strongly acid to slightly acid in the surface layer and ranges from very strongly acid to slightly acid in the subsoil. Permeability is moderately rapid, and the available water capacity is very low. The root zone is shallow.

Included in mapping are some small areas of Bismarck, Carnasaw, Sherless, and Sherwood soils. Also included are a few areas of soils that have slopes of more than 8 percent. The included soils make up 20 percent of the map unit.

The soils in this map unit are not suited to cultivated crops. Surface stones and rapid runoff are the main limitations. Erosion is a severe hazard.

Pirum soil is well suited to pasture, Zafra soil is moderately suited, and Clebit soil is poorly suited. Suitable pasture plants are bermudagrass, bahiagrass, clover, lespedeza, and tall fescue. Surface stones on Zafra and Clebit soils restrict the use of farm equipment. Concerns in management include proper grazing and weed and brush control.

The soils in this map unit mainly are used as woodland. Potential productivity of Pirum and Zafra soils is moderately high for commercial wood crops and on Clebit soil potential productivity is low. Suitable trees include loblolly pine, shortleaf pine, and southern red oak. Pirum soil has no significant limitations to woodland use or management. Zafra and Clebit soils have a moderate equipment limitation because of surface stones. Because of the shallow root zone of Clebit soil, seeding mortality is a moderate limitation.

Pirum and Zafra soils are moderately suited to most urban uses, and Clebit soil is poorly suited. Depth to bedrock is a severe limitation to use of these soils for septic tank absorption fields. Depth to bedrock is a moderate limitation for dwellings and for local roads and streets on Pirum and Zafra soils. Depth to bedrock and slope are moderate limitations for small commercial buildings on Pirum and Zafra soils. Depth to bedrock is a severe limitation for dwellings and small commercial buildings and for local roads and streets on Clebit soil.

Depth to bedrock limitations are difficult and generally impractical to overcome for most urban uses. Slope limitations for dwellings and small commercial buildings may require special design to conform to the natural contour of the land to help offset this limitation.

The soils in this map unit are in capability subclass VIs. Pirum soil is in woodland suitability group 3o7. Zafra soil is in woodland suitability group 3x8. Clebit soil is in woodland suitability group 5x8.

56—Pits-Fluvaquents complex, occasionally flooded. This map unit consists of active and abandoned sand and gravel pits and deep, poorly drained, level to moderately steep Fluvaquents on flood

plains in the Coastal Plain. These areas are so intricately mixed or so small that it was not practical to separate them at the scale selected for mapping. Mapped areas range from about 2 to 100 acres. The individual areas are about 0.1 acre to 5 acres. The slopes are 0 to 20 percent.

Pits make up about 45 percent of the map unit. Typically, Pits are about 10 feet deep and have almost vertical side walls. They range from about 0.1 acre to about 2 acres. Some are filled with water.

Fluvaquents make up about 35 percent of the map unit. They are poorly drained soils that have been altered or obscured by mining operations. Typically, the Fluvaquents are gravelly fine sandy loam, very gravelly fine sandy loam, or extremely gravelly fine sandy loam. They are at a depth of about 4 feet or more. Gravel content ranges from about 20 to 95 percent. Slopes are level to moderately steep and are generally broken and uneven because of the mining operations.

Fluvaquents are low in natural fertility and organic matter content. Reaction is strongly acid to medium acid throughout. Permeability is moderate to rapid and the available water capacity is very low to moderate.

The remaining 20 percent of this complex consists of areas of Ouachita and Sardis soils. Also included are mining roads and trails and remnants of gravel and sand stockpiles.

The soils in this map unit are not suited to cultivated crops, improved pasture, or woodland in their present condition. Reclamation and smoothing is necessary before these soils can be used. If the soil is smoothed and a close-growing cover crop is kept on the soil most of the time, crops, such as grain sorghum or small grains, can be grown. Also, if smoothed, improved pasture of bermudagrass or bahiagrass or bottom land hardwood trees can be grown on these soils.

These areas are not suited to urban uses. Rough, broken slopes and flooding are the main limitations. Reclamation, smoothing, and major flood control structures are necessary to overcome these limitations.

These areas have not been assigned to a capability subclass or to a woodland suitability group.

57—Sacul fine sandy loam, 3 to 8 percent slopes. This deep, moderately well drained, gently sloping soil is on hilltops and upper side slopes in the Coastal Plain. The individual areas are about 5 to 200 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer is yellowish brown fine sandy loam to a depth of about 8 inches. The subsoil is red silty clay to a depth of about 18 inches; red, mottled silty clay to a depth of about 37 inches; yellowish red, mottled silty clay to a depth of about 55 inches; and mottled gray and yellowish red silty clay loam to a depth of 72 inches.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability is slow, and the available water capacity is high. A seasonal high water table is at a depth of 24 to 48 inches from December through April. This soil has good tilth, but wetness can delay tillage operations. Crops respond well to fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration.

Included with this soil in mapping are a few small areas of Ora and Smithdale soils. Also included are soils that are similar to Sacul soil, but they have a subsoil that is yellowish brown; a few small areas of soils that are more sandy throughout than the Sacul soil; and a few areas of eroded soils.

This Sacul soil is poorly suited to cultivated crops, although grain sorghum and small grains can be grown. Runoff is medium or rapid. Erosion is a very severe hazard if this soil is used for cultivated crops. If management practices that include minimum tillage, contour farming, and terracing the steeper slopes are used, crops that leave a large amount of residue on the surface can be grown occasionally. As slope length and gradient increase, conservation treatment should be intensified.

This soil is moderately suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

This soil mainly is used as woodland. Potential productivity is moderately high for commercial wood products. Suitable trees include loblolly pine and shortleaf pine. Equipment limitations are moderate because of the shallow depth to the clayey subsoil. Heavy traffic on access roads and skid trails causes deep rutting.

This soil is poorly suited to most urban uses. Slow permeability and wetness are severe limitations for septic tank absorption fields. These limitations are difficult and often impractical to overcome. They can be partly alleviated by increasing the size of the absorption field and installing a subsurface drainage system around the perimeter. High shrink-swell potential is a severe limitation for dwellings and small commercial buildings. This limitation can be partly overcome by adequately reinforcing foundations. Low strength and high shrink-swell potential are severe limitations for local roads and streets. Adding suitable subgrade fill material to the roadbed helps to alleviate these limitations.

This Sacul soil is in capability subclass IVe and in woodland suitability group 3c2.

58—Sacul fine sandy loam, 8 to 12 percent slopes. This deep, moderately well drained, moderately sloping soil is on side slopes in the Coastal Plain. The individual areas are about 10 to 80 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer is

yellowish brown fine sandy loam to a depth of about 8 inches. The subsoil is red silty clay to a depth of about 18 inches; red, mottled silty clay to a depth of about 37 inches; yellowish red, mottled silty clay to a depth of about 55 inches; and mottled gray and yellowish red silty clay loam to a depth of 72 inches.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability is slow, and the available water capacity is high. A seasonal high water table is at a depth of 24 to 48 inches from December through April. Pastures respond well to fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration.

Included with this soil in mapping are a few small areas of Bowie, Ora, and Smithdale soils. Also included are a few areas of soils that have a gravelly surface layer, a few small areas of soils that have slopes of more than 12 percent, and a few areas of eroded soils.

This Sacul soil is not suited to cultivated crops. Runoff is rapid. Erosion is a very severe hazard if this soil is used for cultivated crops.

This soil is moderately suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

This soil mainly is used as woodland. Potential productivity is moderately high for commercial wood products. Suitable trees include loblolly pine and shortleaf pine. Equipment limitations are moderate because of the shallow depth to the clayey subsoil. Heavy traffic on access roads and skid trails causes deep rutting.

This soil is poorly suited to most urban uses. Slow permeability and wetness are severe limitations for septic tank absorption fields. These limitations are difficult and often impractical to overcome. Increasing the size of the absorption fields and installing a subsurface drainage system around the perimeter can help to alleviate these limitations.

Slope and high shrink-swell potential are severe limitations for dwellings and small commercial buildings. The shrink-swell potential limitation can be partly overcome by adequately reinforcing foundations. Slope limitation is expensive and often impractical to overcome. Designing dwellings and small commercial buildings to conform to the natural slope of the land can help offset the slope limitation.

Low strength and high shrink-swell potential are severe limitations for local roads and streets. Adding suitable subgrade fill material to the roadbed helps to alleviate these limitations.

This Sacul soil is in capability subclass VIe and in woodland suitability group 3c2.

59—Sacul fine sandy loam, 12 to 20 percent slopes. This deep, moderately well drained, moderately sloping to moderately steep soil is on side slopes in the Coastal Plain. The individual areas are about 10 to 100 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer is yellowish brown fine sandy loam to a depth of about 8 inches. The subsoil is red silty clay to a depth of about 18 inches; red, mottled silty clay to a depth of about 37 inches; yellowish red, mottled silty clay to a depth of about 55 inches; and mottled gray and yellowish red silty clay loam to a depth of 72 inches.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability is slow, and the available water capacity is high. A seasonal high water table is at a depth of 24 to 48 inches from December through April. Pastures respond well to fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration.

Included with this soil in mapping are a few small areas of Cuthbert, Saffell, and Smithdale soils. Also included are some areas of soils that have slopes of more than 20 percent, a few small areas of soils that have a gravelly surface layer, and a few areas of eroded soils.

This Sacul soil is not suited to cultivated crops. Runoff is rapid. Erosion is a very severe hazard if this soil is used for cultivated crops.

This soil is moderately suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

This soil mainly is used as woodland. Potential productivity is moderately high for commercial wood products. Suitable trees include loblolly pine and shortleaf pine. Equipment limitations are moderate because of the shallow depth to the clayey subsoil. Heavy traffic on access roads and skid trails causes deep rutting.

This soil is poorly suited to most urban uses. Slow permeability, wetness, and slope are severe limitations for septic tank absorption fields. These limitations are difficult and often impractical to overcome. Increasing the size of the absorption fields and installing a subsurface drainage system around the perimeter can help to alleviate these limitations.

High shrink-swell potential and slope are severe limitations for dwellings and small commercial buildings. The shrink-swell limitation can be partly overcome by adequately reinforcing foundations. Slope limitation is expensive and often impractical to overcome. It may require extensive cut and fill operations. An alternative is to design dwellings and commercial buildings to conform to the natural slope of the land.

Low strength, slope, and high shrink-swell potential are severe limitations for local roads and streets. Adding suitable subgrade fill material to the roadbed can help

offset the low strength limitation. The slope limitations generally can be offset by constructing roads and streets on the contour and adapting the design to the slope.

This Sacul soil is in capability subclass VIe and in woodland suitability group 3c2.

60—Sacul gravelly fine sandy loam, 3 to 8 percent slopes. This deep, moderately well drained, gently sloping soil is on hilltops and upper side slopes in the Coastal Plain. The individual areas are about 10 to 40 acres.

Typically, the surface layer is dark grayish brown gravelly fine sandy loam about 4 inches thick. The subsurface layer is yellowish brown gravelly fine sandy loam to a depth of about 8 inches. The subsoil is red silty clay to a depth of about 18 inches; red, mottled silty clay to a depth of about 37 inches; yellowish red, mottled silty clay to a depth of about 55 inches; and mottled gray and yellowish red silty clay loam to a depth of 72 inches.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability is slow, and the available water capacity is high. A seasonal high water table is at a depth of 24 to 48 inches from December through April. This soil has good tilth, but wetness can delay tillage operations. Crops respond well to fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration.

Included with this soil in mapping are a few small areas of Ora, Saffell, and Smithdale soils. Also included are soils that are similar to Sacul soil except that the subsoil is yellowish brown and a few areas of eroded soils.

This Sacul soil is poorly suited to cultivated crops. Suitable crops include grain sorghum and small grains. Runoff is medium or rapid. Erosion is a severe hazard if this soil is used for cultivated crops. If management practices that include minimum tillage, contour farming, terracing of the steeper slopes are used, tilled crops that leave a large amount of residue on the surface can be grown occasionally. As slope length and gradient increase, conservation treatment should be intensified.

This soil is moderately suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

This soil mainly is used as woodland. Potential productivity is moderately high for commercial wood products. Suitable trees include loblolly pine and shortleaf pine. Equipment limitations are moderate because of the shallow depth to the clayey subsoil. Heavy traffic on access roads and skid trails causes deep rutting.

This soil is poorly suited to most urban uses. Slow permeability and wetness are severe limitations for septic tank absorption fields. These limitations are difficult and often impractical to overcome. Increasing the size of the absorption fields and installing a subsurface drainage system around the perimeter can help to alleviate these limitations.

High shrink-swell potential is a severe limitation for dwellings and small commercial buildings. This limitation can be partly overcome by adequately reinforcing foundations.

Low strength and high shrink-swell potential are severe limitations for local roads and streets. Adding suitable subgrade fill material to the roadbed helps to offset these limitations.

This Sacul soil is in capability subclass IVe and in woodland suitability group 3c2.

61—Sacul gravelly fine sandy loam, 8 to 20 percent slopes. This deep, moderately well drained, moderately sloping to moderately steep soil is on side slopes in the Coastal Plain. The individual areas are about 10 to 100 acres.

Typically, the surface layer is dark grayish brown gravelly fine sandy loam about 4 inches thick. The subsurface layer is yellowish brown gravelly fine sandy loam to a depth of about 8 inches. The subsoil is red silty clay to a depth of about 18 inches; red, mottled silty clay to a depth of about 37 inches; yellowish red, mottled silty clay to a depth of about 55 inches; and mottled gray and yellowish red silty clay loam to a depth of 72 inches.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is slow, and the available water capacity is high. A seasonal high water table is at a depth of 24 to 48 inches from December through April. Pastures respond well to fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration.

Included with this soil in mapping are a few small areas of Cuthbert, Saffell, and Smithdale soils. Also included are areas of soils that have slopes of more than 20 percent and a few areas of eroded soils.

This Sacul soil is not suited to cultivated crops. Runoff is rapid. Erosion is a very severe hazard if this soil is used for cultivated crops.

This soil is moderately suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

This soil mainly is used as woodland. Potential productivity is moderately high for commercial wood products. Suitable trees include loblolly pine and shortleaf pine. Equipment limitations are moderate because of the shallow depth to the clayey subsoil. Heavy traffic on access roads and skid trails causes deep rutting.

This soil is poorly suited to most urban uses. Slow permeability and wetness are severe limitations for septic tank absorption fields. These limitations are difficult and often impractical to overcome. Increasing the size of the absorption field and installing a subsurface drainage system around the perimeter can partly alleviate these limitations.

High shrink-swell potential is a severe limitation for dwellings and small commercial buildings. This limitation can be partly overcome by adequately reinforcing foundations. Slope is a severe limitation for small commercial buildings. This limitation is expensive and often impractical to overcome. Slope limitation often requires extensive cut and fill operations. An alternative is to design dwellings and small commercial buildings to conform to the natural contour of the land.

Low strength and high shrink-swell potential are severe limitations for local roads and streets. Adding suitable subgrade fill material to the roadbed can help offset these limitations.

This Sacul soil is in capability subclass VIe and in woodland suitability group 3c2.

62—Sacul-Ruston association, undulating. This map unit consists of deep, moderately well drained and well drained, nearly level to gently sloping soils in the Coastal Plain. These soils formed in acid marine sediment. The Sacul soil is on upper side slopes. Ruston soil is on ridgetops. Mapped areas range from about 25 to 200 acres. The composition is variable; however, the detail of mapping is adequate for the expected uses of these soils. The slopes are 1 to 8 percent.

The moderately well drained Sacul soil makes up about 50 percent of the map unit. Typically, the surface layer is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer is yellowish brown fine sandy loam to a depth of about 8 inches. The subsoil is red silty clay to a depth of about 18 inches; red, mottled silty clay to a depth of about 37 inches; yellowish red, mottled silty clay to a depth of about 55 inches; and mottled gray and yellowish red silty clay loam to a depth of 72 inches.

Sacul soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability is slow, and the available water capacity is high. A seasonal high water table is at a depth of 24 to 48 inches from December through April. This soil has good tilth, but wetness can delay tillage operations. Crops respond well to fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration.

The well drained Ruston soil makes up about 30 percent of the map unit. Typically, the surface layer is dark brown fine sandy loam about 5 inches thick. The subsurface layer is pale brown fine sandy loam to a depth of about 13 inches. The subsoil is yellowish red sandy clay loam to a depth of about 25 inches; yellowish red sandy clay loam and pale brown fine sandy loam to a depth of about 30 inches; and mottled pale brown, yellowish red, and dark red sandy clay loam to a depth of 63 inches. The underlying material is mottled red, light brownish gray, and dark red loam to a depth of 72 inches.

Ruston soil is low in natural fertility and organic matter content. Permeability is moderate, and the available water capacity is moderate. Reaction ranges from very strongly acid to slightly acid in the surface and subsurface layers and ranges from very strongly acid to medium acid in the subsoil and substratum. This soil has good tilth and can be tilled throughout a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included in mapping are small areas of Bowie, Smithdale, Savannah, and Ora soils. The included soils make up 20 percent of the map unit.

Sacul soil is poorly suited to cultivated crops. Suitable crops include grain sorghum and small grains. Runoff is medium or rapid. Erosion is a very severe hazard if cultivated crops are grown. If management practices that include minimum tillage, contour farming, and terracing of the steeper slopes are used, crops that leave a large amount of residue on the surface can be grown occasionally. As slope length and gradient increase, conservation treatment should be intensified.

Ruston soil is moderately suited to cultivated crops. Suitable crops include corn, grain sorghum, small grains, and truck crops. Runoff is medium or rapid. Erosion is severe hazard if cultivated crops are grown. If management practices that include minimum tillage, contour farming, and terracing of the steeper slopes are used, crops that leave a large amount of residue can be grown year after year. As slope length and gradient increase, conservation treatment should be intensified.

Sacul soil is moderately suited to pasture or hay crops, and Ruston soil is well suited. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

These soils mainly are used as woodland. Potential productivity is moderately high for commercial wood products. Suitable trees include loblolly pine and shortleaf pine. Equipment use on Sacul soil is a moderate limitation because of the shallow depth to the clayey subsoil. Heavy traffic on access roads and skid trails causes deep rutting. Ruston soil has no significant limitations to woodland use and management.

Sacul soil is poorly suited to most urban uses. Slow permeability and wetness are severe limitations for septic tank absorption fields. These limitations are difficult and often impractical to overcome. Increasing the size of the absorption fields and installing a subsurface drainage system around the perimeter helps to alleviate these limitations.

The high shrink-swell potential of the Sacul soil is a severe limitation for dwellings and small commercial buildings. This limitation can be partly overcome by adequately reinforcing foundations. Low strength and high shrink-swell potential are severe limitations for local roads and streets. Adding suitable subgrade fill material to the roadbed can help offset these limitations.

Ruston soil is moderately suited to most urban uses. Moderate permeability is a moderate limitation for septic tank absorption fields. Increasing the size of the absorption fields helps to alleviate this limitation.

Ruston soil has no significant limitations for dwellings. Slope is a moderate limitation for small commercial buildings. Designing dwellings and small commercial buildings to conform to the natural contour of the land can help offset this limitation. Low strength is a moderate limitation for local roads and streets. Adding suitable subgrade fill material to the roadbed can help to minimize this limitation.

Sacul soil is in capability subclass IVe and in woodland suitability group 3c2. Ruston soil is in the capability subclass IIIe and in woodland suitability group 3o1.

63—Sacul-Smithdale association, rolling. This map unit consists of deep, moderately well drained and well drained, moderately sloping to moderately steep soils in the Coastal Plain. These soils formed in acid marine sediment. Sacul soil is on dissected side slopes. Smithdale soil is on the more uniform side slopes. Mapped areas are about 50 to 500 acres or more. The composition is variable; however, the detail of mapping is adequate for the expected uses of these soils. The slopes are 8 to 20 percent.

The moderately well drained Sacul soil makes up about 50 percent of this map unit. Typically, the surface layer is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer is yellowish brown fine sandy loam to a depth of about 8 inches. The subsoil is red silty clay to a depth of about 18 inches; red, mottled silty clay to a depth of about 37 inches; yellowish red, mottled silty clay to a depth of about 55 inches; and mottled gray and yellowish red silty clay loam to a depth of 72 inches.

Sacul soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability is slow, and the available water capacity is high. A seasonal high water table is at a depth of 24 to 48 inches from December through April. Pastures respond well to fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration.

The well drained Smithdale soil makes up about 30 percent of this map unit. Typically, the surface layer is brown fine sandy loam about 7 inches thick. The subsoil is yellowish red sandy clay loam to a depth of about 42 inches and yellowish red sandy loam to a depth of 72 inches.

Smithdale soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is moderate, and the available water capacity is moderate. This soil has good tilth and can be tilled throughout a wide range of moisture content. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

Included in mapping are small areas of Bowie, Savannah, and Cuthbert soils. Also included are a few small areas of soils that have slopes of less than 8 percent and a few small areas of soils that have slopes of more than 20 percent. The included soils make up 20 percent of this map unit.

The soils in this map unit are not suited to cultivated crops. Runoff is rapid. Erosion is a very severe hazard if this soil is used for cultivated crops.

Sacul soil is moderately suited to pasture or hay crops, and Smithdale soil is well suited. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

Sacul soil mainly is used for woodland. Potential productivity is moderately high for commercial wood products. Suitable trees include loblolly pine and shortleaf pine. Equipment use is a moderate limitation because of the shallow depth to the clayey subsoil. Heavy traffic on access roads and skid trails causes deep rutting. Smithdale soil mainly is used as woodland. Potential productivity is moderately high for commercial wood crops. Suitable trees include loblolly pine and shortleaf pine. This soil has no significant limitations to woodland use and management.

Sacul soil is poorly suited to most urban uses. Slow permeability and wetness are severe limitations for septic tank absorption fields. These limitations are difficult and often impractical to overcome. Increasing the size of the absorption fields and installing a subsurface drainage system around the perimeter can help alleviate these limitations.

The high shrink-swell potential of Sacul soil is a severe limitation for dwellings and small commercial buildings. This limitation can be partly overcome by adequately reinforcing foundations. Slope is a severe limitation for small commercial buildings. This limitation often requires extensive cut and fill operations. An alternative is to design dwellings and small commercial buildings to conform to the natural contour of the land. Low strength and high shrink-swell potential are severe limitations for local roads and streets. Adding suitable subgrade fill material to the roadbed can help offset these limitations.

Smithdale soil is moderately suited to most urban uses. Moderate permeability and slope are moderate limitations for septic tank absorption fields. Installing distribution lines on the contour and increasing the size of the absorption fields helps to alleviate these limitations. Slope is a moderate limitation for dwellings

and for local roads and streets. Slope is a severe limitation for small commercial buildings. Designing dwellings and small commercial buildings to conform to the natural contour of the land can help offset this limitation.

The soils in this map unit are in capability subclass VIe. Sacul soil is in woodland suitability group 3c2. Smithdale soil is in woodland suitability group 3o1.

64—Saffell gravelly fine sandy loam, 3 to 8 percent slopes. This deep, well drained, gently sloping soil is on hilltops and upper side slopes in the Coastal Plain. The individual areas are about 5 to 100 acres.

Typically, the surface layer is dark grayish brown gravelly fine sandy loam about 6 inches thick. The subsoil is yellowish brown gravelly fine sandy loam to a depth of about 11 inches and yellowish red very gravelly sandy clay loam to a depth of about 57 inches. The underlying material is reddish yellow extremely gravelly sandy loam to a depth of 72 inches.

This soil is low in natural fertility and organic matter content. Reaction ranges from strongly acid or very strongly acid throughout. Permeability is moderate, and the available water capacity is low. This soil has poor tilth because of its high gravel content. The root zone is deep, but the gravelly subsoil can restrict root penetration.

Included with this soil in mapping are small areas of Pikeville, Sacul, and Ora soils. Also included are a few small areas of eroded soils.

This Saffell soil is moderately suited to cultivated crops. Suitable crops include grain sorghum and small grains. This soil is suitable for orchards. Runoff is medium or rapid. Erosion is a severe hazard if this soil is used for cultivated crops. Surface gravel hinders some tillage operations. If management practices that include minimum tillage, contour farming, and terracing of the steeper slopes are used, crops that leave a large amount of residue on the surface can be grown year after year. As slope length and gradient increase, conservation treatment should be intensified.

This soil is moderately suited to improved pasture or hay crops. Suitable pasture plants are bermudagrass and bahiagrass. Concerns in management include proper grazing and weed and brush control.

This soil mainly is used as woodland. Potential productivity is moderate for commercial wood products. Suitable trees include loblolly pine and shortleaf pine. This Saffell soil has no significant limitations to woodland use and management.

This soil is moderately suited to most urban uses. Moderate permeability is a moderate limitation for septic tank absorption fields. This limitation can be partly overcome by increasing the size of the absorption field.

This soil has no significant limitations for dwellings or for local roads and streets. Slope is a moderate limitation for small commercial buildings. This limitation can be overcome by designing the structures to conform to the natural slope of the land.

This Saffell soil is in capability subclass IIIe and in woodland suitability group 4o1.

65—Saffell gravelly fine sandy loam, 8 to 12 percent slopes. This deep, well drained, moderately sloping soil is on side slopes in the Coastal Plain. The individual areas are about 10 to 80 acres.

Typically, the surface layer is dark grayish brown gravelly fine sandy loam about 6 inches thick. The subsoil is yellowish brown gravelly fine sandy loam to a depth of about 11 inches and yellowish red very gravelly sandy clay loam to a depth of about 57 inches. The underlying material is reddish yellow extremely gravelly sandy loam to a depth of 72 inches.

This soil is low in natural fertility and organic matter content. Reaction ranges from strongly acid or very strongly acid throughout. Permeability is moderate, and the available water capacity is low. This soil has poor tilth because of its high gravel content. The root zone is deep, but the gravelly subsoil can restrict root penetration.

Included with this soil in mapping are small areas of Pikeville, Sacul, Ora, and Smithdale soils. Also included are a few small areas of eroded soils.

This Saffell soil is poorly suited to cultivated crops, although grain sorghum, and small grains can be grown. This soil can be used for orchards. Runoff is rapid. Erosion is a very severe hazard if this soil is used for cultivated crops. Surface gravel hinders some tillage operations. If management practices that include minimum tillage, contour farming, and terracing are used, crops that leave a large amount of residue on the surface can be grown occasionally. As slope length and gradient increase, conservation treatment should be intensified.

This soil is moderately suited to improved pasture or hay crops. Suitable pasture plants are bermudagrass and bahiagrass. Because of the high content of gravel and the low available water capacity, this soil is droughty in the summer. Concerns in management include proper grazing and weed and brush control.

This Saffell soil mainly is used as woodland. Potential productivity is moderate for commercial wood products. Suitable trees include loblolly pine and shortleaf pine. This soil has no significant limitations for woodland use and management.

This soil is moderately suited to most urban uses. Moderate permeability and slope are moderate limitations for septic tank absorption fields. These limitations are difficult and often impractical to overcome. Increasing the size of the absorption fields or by installing distribution lines on the contour help to alleviate these limitations.

Slope is a moderate limitation for dwellings and for local roads and streets and is a severe limitation for

small commercial buildings. This limitation can be partly overcome by designing structures to conform to the natural slope of the land.

This Saffell soil is in capability subclass IVe and in woodland suitability group 4o1.

66—Saffell-Sacul association, rolling. This map unit consists of deep, well drained and moderately well drained, moderately sloping to moderately steep soils on side slopes in the Coastal Plain. These gravelly and clayey soils formed in acid marine sediment. Saffell soil is in high positions on the landscape. Sacul soil generally is in low positions on the landscape. Mapped areas are about 25 to 500 acres or more. The composition is variable; however, the detail of mapping is adequate for the expected uses of the soils. The slopes are 8 to 20 percent.

The well drained Saffell soil makes up about 45 percent of this map unit. Typically, the surface layer is dark grayish brown gravelly fine sandy loam about 6 inches thick. The subsoil is yellowish brown gravelly fine sandy loam to a depth of about 11 inches and yellowish red very gravelly sandy clay loam to a depth of about 57 inches. The underlying material is reddish yellow extremely gravelly sandy loam to a depth of 72 inches.

Saffell soil is low in natural fertility and organic matter content. Reaction ranges from strongly acid or very strongly acid throughout. Permeability is moderate, and the available water capacity is low. This soil has poor tilth because of its high gravel content. The root zone is deep, but the gravelly subsoil can restrict root penetration.

The moderately well drained Sacul soil makes up about 35 percent of this map unit. Typically, the surface layer is dark grayish brown gravelly fine sandy loam about 4 inches thick. The subsurface layer is yellowish brown gravelly fine sandy loam to a depth of about 8 inches. The subsoil is red silty clay to a depth of about 18 inches; red, mottled silty clay to a depth of about 37 inches; yellowish red, mottled silty clay to a depth of about 55 inches; and mottled gray and yellowish red silty clay loam to a depth of 72 inches.

Sacul soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability is slow, and the available water capacity is high. A seasonal high water table is at a depth of 24 to 48 inches from December through April. Pastures respond well to fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration.

Included in mapping are some small areas of Pikeville, Smithdale, and Bowie soils. Also included are a few small areas of soils that have slopes of less than 8 percent and a few small, very narrow strips of alluvial soils that parallel the small streams. The included soils make up 20 percent of this map unit.

The soils in this map unit are not suited to cultivated crops. Runoff is rapid. Erosion is a very severe hazard if these soils are used for cultivated crops. These soils are suited to pasture or woodland.

Saffell soil is poorly suited to improved pasture or hay crops. Suitable pasture plants are bermudagrass and bahiagrass. Because of the high content of gravel and the available water capacity, this soil is droughty in the summer. Concerns in management include proper grazing and weed and brush control.

Sacul soil is moderately suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

Saffell soil is used mainly as woodland. Potential productivity is moderate for commercial wood products. Suitable trees to plant are loblolly pine and shortleaf pine. This soil has no significant limitations for woodland use and management.

Sacul soil mainly is used as woodland. Potential productivity is moderately high for commercial wood products. Suitable trees include loblolly pine and shortleaf pine. Equipment limitations are moderate because of the shallow depth to the clayey subsoil. Heavy traffic on access roads and skid trails causes deep rutting.

Saffell soil is moderately suited to most urban uses. Moderate permeability and slope are moderate limitations for septic tank absorption fields. These limitations are difficult and often impractical to overcome. Increasing the size of the absorption fields and installing distribution lines on the contour help to alleviate these limitations. Slope is a moderate limitation for dwellings and for local roads and streets and is a severe limitation for small commercial buildings. This limitation can be partly overcome by designing structures to conform to the natural slope of the land.

Sacul soil is poorly suited to most urban uses. Slow permeability and wetness are severe limitations for septic tank absorption fields. These limitations are difficult and often impractical to overcome. Increasing the size of the absorption field and installing a subsurface drainage system around the perimeter can help to alleviate these limitations. High shrink-swell potential is a severe limitation for dwellings and small commercial buildings. This limitation can be partly overcome by adequately reinforcing foundations. Slope is a severe limitation for small commercial buildings. This limitation often requires extensive cut and fill operations. An alternative is to design structures to conform to the natural contour of the land. Low strength and high shrink-swell potential are severe limitations for local roads and streets. Adding suitable subgrade fill material to the roadbed helps to alleviate these limitations.

The soils in this map unit are in capability subclass VIe. Saffell soil is in woodland suitability group 4o1. Sacul soil is in woodland suitability group 3c2.

67—Sardis silt loam, 0 to 3 percent slopes. This deep, somewhat poorly drained, level to nearly level soil is on stream terraces in the Coastal Plain. This soil is rarely flooded. Areas of this soil are long and narrow. They are parallel to the flood plain. The slopes are smooth and convex. The individual areas are about 20 to 100 acres.

Typically, the surface layer is dark grayish brown silt loam about 6 inches thick. The subsoil is yellowish brown, mottled silt loam to a depth of about 13 inches; yellowish brown, mottled silty clay loam to a depth of about 39 inches; and mottled gray and yellowish brown silty clay loam to a depth of about 65 inches. The underlying material is mottled gray and yellowish brown loam to a depth of 72 inches.

This soil is moderate in natural fertility and low in organic matter content. Reaction ranges from medium acid to very strongly acid throughout. Permeability is moderate, and the available water capacity is high. A seasonal high water table is at a depth of 12 to 36 inches from January through May. This soil has good tilth, but wetness often delays tillage operations. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Guyton and Ouachita soils.

This Sardis soil is well suited to cultivated crops. Suitable crops include rice, soybeans, grain sorghum, and small grains. Runoff is slow. Erosion is a moderate hazard if this soil is used for cultivated crops. Tillage operations are often delayed for several days because of surface water if an adequate drainage system is not installed. If management practices that include minimum tillage and contour farming are used, crops that leave a large amount of residue on the surface can be grown year after year. Crops that leave a large amount of surface residue reduce surface crusting, increase organic matter, and improve tilth.

This soil mainly is used as pasture, and it is well suited to this use. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Wetness restricts the use of some farm equipment and limits grazing in the winter and early in the spring. Grazing when the soil is saturated causes sod damage and surface compaction. Concerns in management include rotation grazing and weed and brush control.

Potential productivity is very high for commercial wood crops. Suitable trees include loblolly pine and sweetgum. Because of wetness, the use of equipment is a moderate limitation to woodland use and management. This limitation is difficult or impractical to overcome but can be minimized by planting and harvesting during dry periods.

This soil is poorly suited to most urban uses. Wetness is a severe limitation for septic tank absorption fields. This limitation is difficult or impractical to overcome. Installing a subsurface drainage system around the perimeter can help to alleviate this limitation.

Wetness and rare flooding are severe limitations for dwellings and small commercial buildings. These limitations are difficult and often impractical to overcome. Major flood control structures are necessary to overcome the flooding limitations. Installing diversions and drainage systems can help to alleviate the wetness problem for dwellings and commercial buildings.

Low strength is a severe limitation for local roads and streets. Constructing roads and streets on suitable subgrade fill material often helps offset this limitation.

This Sardis soil is in capability subclass IIw and in woodland suitability group 1w8.

68—Sardis silt loam, occasionally flooded. This deep somewhat poorly drained, level soil is on flood plains and low terraces in the Coastal Plain. The individual areas are about 6 to 100 acres. The slopes are 0 to 1 percent.

Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The subsoil is yellowish brown, mottled silt loam to a depth of 13 inches; yellowish brown, mottled silty clay loam to a depth of about 39 inches; and mottled gray and yellowish brown silty clay loam to a depth of about 65 inches. The underlying material is mottled gray and yellowish brown loam to a depth of 72 inches.

This soil is moderate in natural fertility and low in organic matter content. Reaction ranges from medium acid to very strongly acid throughout. Permeability is moderate, and the available water capacity is high. A seasonal high water table is at a depth of 12 to 36 inches from January through May. This soil has good tilth, but wetness often delays tillage operations. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

This soil is flooded occasionally for brief periods from December through May. If this soil doesn't have a vegetative cover, fast-moving floodwaters can cause severe scouring in a short time.

Included with this soil in mapping are a few small areas of Guyton and Ouachita soils. Also included are a few areas of eroded soils that were scoured by floodwater and a few floodwater relief channels.

This Sardis soil is well suited to cultivated crops. Suitable crops include rice, soybeans, grain sorghum, and small grains. Wetness and flooding are main limitations. Tillage operations are often delayed several days after a rain if an adequate drainage system is not installed. If management practices that include minimum tillage, drainage, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Wetness restricts the

use of some farm equipment and limits grazing in winter and early in the spring. Concerns in management include rotation grazing and weed and brush control.

This soil mainly is used as woodland. Potential productivity is very high for commercial wood crops. Suitable trees include loblolly pine and sweetgum. Because of wetness, the use of equipment is a moderate limitation to woodland use and management. This limitation is difficult to overcome but can be minimized by planting and harvesting during dry periods.

This soil is poorly suited to most urban uses. Wetness and flooding are severe limitations for septic tank absorption fields and for dwellings and small commercial buildings. Low strength and flooding are severe limitations for local roads and streets. These limitations are difficult and often impractical to overcome. The wetness limitation can be partly alleviated by installing drainage systems. Major flood control structures are necessary to overcome the flooding limitation.

This Sardis soil is in capability subclass IIw and in woodland suitability group 1w8.

69—Savannah fine sandy loam, 1 to 3 percent slopes. This deep, moderately well drained, nearly level soil is on broad hilltops in the Coastal Plain. This soil has a dense, brittle fragipan. The slopes are smooth and convex. The individual areas are about 5 to 50 acres.

Typically, the surface layer is dark brown fine sandy loam about 5 inches thick. The subsurface layer is brown fine sandy loam to a depth of about 8 inches. The subsoil is yellowish brown loam to a depth of about 15 inches and yellowish brown, mottled loam to a depth of about 25 inches. Below that is a dense, compact and brittle fragipan that is mottled yellowish brown, light brownish gray, and red loam to a depth of about 37 inches; mottled red, gray, and yellowish brown loam to a depth of about 49 inches; mottled yellowish brown, gray, and red loam to a depth of about 69 inches; and mottled red, gray, and brownish yellow sandy clay loam to a depth of about 72 inches.

This soil is low in natural fertility and organic matter content. Reaction ranges from strongly acid to a very strongly acid throughout. Permeability is moderate above the fragipan and moderately slow in the fragipan. The available water capacity is moderate. A perched water table is at a depth of 18 to 36 inches during the winter and the spring.

Included with this soil in mapping are a few small areas of Bowie, Ora, and Sacul soils. Also included are a few areas of eroded soils.

This Savannah soil is well suited to cultivated crops. Suitable crops include grain sorghum, soybeans, and small grains. Runoff is medium. Erosion is a moderate hazard if this soil is used for cultivated crops. If management practices that include minimum tillage, contour farming, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year. As slope length and gradient increase, conservation treatment should be intensified.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

This Savannah soil mainly is used as woodland. Potential productivity is moderately high for commercial wood crops. Suitable trees include loblolly pine, shortleaf pine, and southern red oak. This soil has no significant limitations to woodland use and management.

This soil is moderately suited to most urban uses. Moderately slow permeability and wetness are severe limitations for septic tank absorption fields. Increasing the size of the absorption fields, using a specially designed alternate system, and installing a drainage system around the perimeter help to alleviate these limitations.

Wetness is a moderate limitation for dwellings and small commercial buildings. Surface diversions and subsurface drainage systems can help offset the wetness limitation.

Wetness is a moderate limitation for local roads and streets. Constructing roads and streets on raised, suitable subgrade fill material can help offset this limitation.

This Savannah soil is in capability subclass IIe and in woodland suitability group 3o7.

70—Savannah fine sandy loam, 3 to 8 percent slopes. This deep, moderately well drained, gently sloping soil is on uplands in the Coastal Plain. The slopes are smooth and convex. The individual areas are about 10 to 40 acres.

Typically, the surface layer is dark brown fine sandy loam about 5 inches thick. The subsurface layer is brown fine sandy loam to a depth of about 8 inches. The subsoil is yellowish brown loam to a depth of about 15 inches and yellowish brown, mottled loam to a depth of about 25 inches. Below that is a dense, compact and brittle fragipan that is mottled yellowish brown, light brownish gray, and red loam to a depth of about 37 inches; mottled red, gray, and yellowish brown loam to a depth of about 49 inches; mottled yellowish brown, gray, and red loam to a depth of about 69 inches; and mottled red, gray, and brownish yellow sandy clay loam to a depth of about 72 inches.

This soil is low in natural fertility and organic matter content. Reaction ranges from strongly acid to very strongly acid throughout. Permeability is moderate above the fragipan and moderately slow in the fragipan. The available water capacity is moderate. A perched water table is at a depth of 18 to 36 inches during the winter and the spring. This soil has good tilth and can be tilled throughout a wide range of moisture content. The

fragipan restricts root penetration and slows the downward movement of water.

Included with this soil in mapping are a few small areas of Bowie, Ora, and Sacul soils. Also included are a few areas of eroded soils.

This Savannah soil is moderately suited to cultivated crops. Suitable crops include grain sorghum, vegetable crops, and small grains. Runoff is medium or rapid. Erosion is a severe hazard if this soil is used for cultivated crops. If management practices that include minimum tillage, contour farming, terracing of the steeper slopes, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year. As slope length and gradient increase, conservation treatment should be intensified.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management are rotation grazing and weed and brush control.

This Savannah soil mainly is used as woodland. Potential productivity is moderately high for commercial wood crops. Suitable trees to plant include loblolly pine, shortleaf pine, and southern red oak. This soil has no significant limitations to woodland use and management.

This soil is moderately suited to most urban uses. Moderately slow permeability and wetness are severe limitations for septic tank absorption fields. Increasing the size of the absorption field, using a specially designed alternate system, and installing a drainage system around the perimeter helps to alleviate these limitations.

Wetness is a moderate limitation for dwellings. Wetness and slope are moderate limitations for small commercial buildings. Surface diversions and subsurface drainage systems can help offset the wetness limitation. Designing dwellings and small commercial buildings to conform to the natural contour of the land helps offset the slope limitation.

Wetness is a moderate limitation for local roads and streets. Constructing roads and streets on raised, suitable subgrade fill material helps offset this wetness limitation.

This Savannah soil is in capability subclass IIIe and in woodland suitability group 3o7.

71—Sawyer loam, 1 to 3 percent slopes. This deep, moderately well drained, nearly level soil is on broad hilltops in the Coastal Plain and on margins of the Blackland Prairie. The individual areas are about 5 to 40 acres.

Typically, the surface layer is brown loam about 5 inches thick. The subsoil is yellowish brown silty clay loam to a depth of about 17 inches; yellowish brown, mottled silty clay loam to a depth of about 29 inches; mottled, yellowish brown, gray, and yellowish red silty clay to a depth of about 61 inches; and mottled red, gray, and yellowish brown clay to a depth of 72 inches.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid to extremely acid throughout. Permeability is slow, and the available water capacity is high. A seasonal high water table is at a depth of 24 to 36 inches during the winter and the spring. This soil has good tilth, but wetness can delay tillage operations. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Mayhew, Wilcox, Savannah, and Sacul soils. Also included are a few small areas of soils that have slopes of more than 3 percent.

This Sawyer soil is well suited to cultivated crops. Suitable crops include rice, grain sorghum, small grains, and soybeans. Runoff is slow or medium. Erosion is a slight to moderate hazard if this soil is used for cultivated crops. If management practices that include minimum tillage, contour farming, crop rotation, and terracing are used, crops that leave a large amount of residue on the surface can be grown year after year. As slope length and gradient increase, conservation treatment should be intensified.

This soil is well suited to improved pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, bahiagrass, and lespedeza. Concerns in management include rotation grazing and weed and brush control.

This Sawyer soil mainly is used as woodland. Potential productivity is high for commercial wood crops. Suitable trees include loblolly pine and shortleaf pine. This soil has no significant limitations to woodland use and management.

This soil is poorly suited to most urban uses. Wetness and slow permeability are severe limitations for septic tank absorption fields. Increasing the size of the absorption field, using a specially designed alternate system, and installing a drainage system around the perimeter help to alleviate these limitations.

Wetness and high shrink-swell potential are moderate limitations for dwellings and small commercial buildings. Installing surface diversions and a subsurface drainage system can help offset the wetness limitation. Adequately reinforcing foundations with steel can help minimize the high shrink-swell potential limitation.

Low strength is a severe limitation for local roads and streets. Adding suitable subgrade fill material to the roadbed helps offset this limitation.

This Sawyer soil is in capability subclass IIe and in woodland suitability group 2o1.

72—Sawyer loam, 3 to 8 percent slopes. This deep, moderately well drained, gently sloping soil is on hillsides in the Coastal Plain and on margins of the Blackland Prairie. The individual areas are about 5 to 80 acres.

Typically, the surface layer is brown loam about 5 inches thick. The subsoil is yellowish brown silty clay loam to a depth of about 17 inches; yellowish brown, mottled silty clay loam to a depth of about 29 inches; mottled yellowish brown, gray, and yellowish red silty clay to a depth of about 61 inches; and mottled red, gray, and yellowish brown clay to a depth of 72 inches.

The soil is low in natural fertility and organic matter content. Reaction is strongly acid to extremely acid throughout. Permeability is slow, and the available water capacity is high. A seasonal high water table is at a depth of 24 to 36 inches during the winter and the spring. This soil has good tilth, but wetness can delay tillage operations. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Wilcox, Sacul, and Savannah soils. Also included are a few small areas of soils that have slopes of more than 8 percent and a few areas of eroded soils.

The Sawyer soil is moderately suited to cultivated crops. Suitable crops include grain sorghum and small grains. Runoff is medium or rapid. Erosion is a severe hazard if the soil is used for cultivated crops. If management practices that include minimum tillage, contour farming, terracing of the steeper slopes, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year. As slope length and gradient increase, conservation treatment should be intensified.

This soil is well suited to improve pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, bahiagrass, and lespedeza. Concerns in management include rotation grazing and weed and brush control.

This Sawyer soil mainly is used as woodland. Potential productivity is high for commercial wood crops. Suitable trees include loblolly pine and shortleaf pine. This soil has no significant limitations to woodland use and management.

This soil is poorly suited to most urban uses. Wetness and slow permeability are severe limitations for septic tank absorption fields. Increasing the size of the absorption field, using a specially designed alternate system, and installing a drainage system around the perimeter help offset these limitations.

Wetness and high shrink-swell potential are moderate limitations for dwellings and small commercial buildings. Installing surface diversions and a subsurface drainage system can help offset the wetness limitation. Adequately reinforcing foundations with steel can help minimize the high shrink-swell potential limitation. Slope also is a moderate limitation for small commercial buildings. Designing dwellings and small commercial buildings to conform to the natural contour of the land helps offset this limitation. Low strength is a severe limitation for local roads and streets. Adding suitable subgrade fill material to the roadbed helps offset this limitation.

This Sawyer soil is in capability subclass IIIe and in woodland suitability group 2o1.

73—Shermore fine sandy loam, 3 to 8 percent slopes. This deep, moderately well drained, gently sloping soil is on ridgetops, side slopes, benches, and fans in the Ouachita Mountains. The slopes are smooth and convex. The individual areas are about 5 to 50 acres.

Typically, the surface layer is dark brown fine sandy loam about 4 inches thick. The subsoil is yellowish brown loam to a depth of about 20 inches. The next layer is a dense, brittle and compact fragipan that is strong brown, mottled clay loam to a depth of about 49 inches. The next layer is mottled gray and strong brown clay loam to a depth of about 71 inches. Below that is tilted and fractured shale bedrock that has lenses of sandstone.

This soil is low in natural fertility and organic matter content. Reaction ranges from slightly acid to strongly acid in the surface and subsurface layers and ranges from medium acid to very strongly acid in the subsoil. Permeability is moderate above the fragipan and moderately slow in the fragipan. The available water capacity is moderate. A perched water table is at a depth of 18 to 42 inches from November through April. This soil has good tilth and can be tilled throughout a wide range of moisture content. The fragipan restricts root penetration and slows the downward movement of water.

Included with this soil in mapping are a few small areas of Pirum, Sherless, and Carnasaw soils. Also included are a few small areas of soils that have slopes of less than 3 percent.

This Shermore soil is moderately suited to cultivated crops. Suitable crops include grain sorghum and small grains. Runoff is medium or rapid. Erosion is a severe hazard if the soil is used for cultivated crops. If management practices that include minimum tillage, contour farming, terracing of the steeper slopes, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year. As slope length and gradient increase, conservation treatment should be intensified.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include deferred grazing and weed and brush control.

This Shermore soil mainly is used as woodland. Potential productivity is moderately high for commercial wood crops. Suitable trees include loblolly pine and shortleaf pine. This soil has no significant limitations to woodland use and management.

This soil is moderately suited to most urban uses. Moderately slow permeability and wetness are severe limitations for septic tank absorption fields. Increasing the size of the absorption field, using a specially designed alternate system, and installing a drainage system around the perimeter helps to alleviate these limitations.

Wetness is a moderate limitation for dwellings. Wetness and slope are moderate limitations for small commercial buildings. Surface diversions and subsurface drainage systems can help offset the wetness limitation. Designing dwellings and small commercial buildings to conform to the natural contour of the land can help minimize the slope limitation.

Wetness also is a moderate limitation for local roads and streets. Constructing roads and streets on raised, suitable subgrade fill material can help offset this limitation.

This Shermore soil is in capability subclass IIIe and in woodland suitability group 3o7.

74—Sherwood fine sandy loam, 3 to 8 percent slopes. This moderately deep to deep, well drained, gently sloping soil is on ridgetops and upper side slopes in the Ouachita Mountains. The slopes are smooth and convex. The individual areas are about 5 to 80 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 5 inches thick. The subsurface layer owish brown fine sandy loam to a depth of about 13 inches. The subsoil is yellowish red sandy clay loam to a depth of about 42 inches; and yellowish red gravelly loam to a depth of about 45 inches. Below that is hard, fractured and tilted sandstone bedrock.

This soil is low in natural fertility and organic matter content. Reaction ranges from medium acid to very strongly acid in the surface and subsurface layers and is very strongly acid or strongly acid in the subsoil. Permeability is moderate, and the available water capacity is moderate. This soil has good tilth and can be tilled throughout a wide range of moisture content. Crops respond well to fertilization. The root zone is moderately deep to deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Pirum, Sherless, Carnasaw, and Shermore soils. Also included are a few small areas of eroded soils.

This Sherwood soil is moderately suited to cultivated crops. Suitable crops include grain sorghum, corn, and small grain. Runoff is medium or rapid. Erosion is a severe hazard if the soil is used for cultivated crops. If management practices that include minimum tillage, contour farming, terracing of the steeper slopes, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year. As slope length and gradient increase, conservation treatment should be intensified.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

This Sherwood soil mainly is used as woodland. Potential productivity is moderately high for commercial wood crops. Suitable trees include loblolly pine, shortleaf pine, and southern red oak. This soil has no significant limitations to woodland use and management.

This soil is moderately suited to most urban uses. Depth to bedrock is a severe limitation for septic tank absorption fields. This limitation is difficult and generally impractical to overcome. An alternate site should be selected in most cases or an alternate system should be used.

Depth to bedrock is a moderate limitation for dwellings and local roads and streets. Building structures above the bedrock and adding fill material when landscaping the area help to alleviate this limitation for dwellings. Depth to bedrock limitations can require special planning as to proper locations for streets and roads and proper grading of the sites to avoid the unnecessary removal of rock. Some areas may require blasting. Slope and depth to bedrock are moderate limitations for small commercial buildings. Building these structures above the bedrock, adding fill material when landscaping the area, and designing structures to conform to the natural contour of the land can help to alleviate these limitations for small commercial buildings.

This Sherwood soil is in capability subclass IIIe and in woodland suitability group 3o7.

75—Sherwood fine sandy loam, 8 to 12 percent slopes. This moderately deep to deep, well drained, moderately sloping soil is on upper side slopes in the Ouachita Mountains. The slopes are smooth and convex. The individual areas are about 10 to 100 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 5 inches thick. The subsurface layer is yellowish brown fine sandy loam to a depth of about 13 inches. The subsoil is yellowish red sandy clay loam to a depth of about 34 inches and yellowish red gravelly loam to a depth of about 45 inches. Below that is hard, fractured and tilted sandstone bedrock that has lenses of shale.

This soil is low in natural fertility and organic matter content. Reaction ranges from medium acid to very strongly acid in the surface and subsurface layers and is very strongly acid or strongly acid in the subsoil. Permeability is moderate, and the available water capacity is moderate. This soil has good tilth and can be tilled throughout a wide range of moisture content. Crops respond well to fertilization. The root zone is moderately deep to deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Pirum, Sherless, Carnasaw, and Shermore soils. Also included are a few small areas of eroded soils and a few small areas of rock outcrops.

This Sherwood soil is not suited to cultivated crops. Moderately steep slopes are the main limitation, and erosion is a very severe hazard.

This soil is moderately suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

This Sherwood soil mainly is used as woodland. Potential productivity is moderately high for commercial wood crops. Suitable trees include loblolly pine, shortleaf pine, and southern red oak. This soil has no significant limitations to woodland use and management.

This soil is poorly suited for most urban uses. Depth to bedrock is a severe limitation for septic tank absorption fields. This limitation is difficult and generally impractical to overcome. An alternate site should be selected in most cases or an alternate system used.

Depth to bedrock and slope are moderate limitations for dwellings and for local roads and streets. Building dwellings above the bedrock and adding fill material when landscaping the area help to alleviate the limitation for depth to bedrock. Designing dwellings to conform to the natural contour of the land helps offset the slope limitation. Depth to bedrock limitations can require constructing roads and streets on the contour, special planning as to proper location, and proper grading of the sites to avoid the unnecessary removal of bedrock. Some areas will require blasting.

Slope is a severe limitation for small commercial buildings. Designing structures to conform to the natural contour of the land can help minimize this limitation.

This Sherwood soil is in capability subclass VIe and in woodland suitability group 3o7.

76—Smithdale fine sandy loam, 3 to 8 percent slopes. This deep, well drained, gently sloping soil is on ridgetops and upper side slopes in the Coastal Plain. The slopes are smooth and convex. The individual areas are about 5 to 70 acres.

Typically, the surface layer is brown fine sandy loam about 7 inches thick. The subsoil is yellowish red sandy clay loam to a depth of about 42 inches and yellowish red sandy loam to a depth of 72 inches.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is moderate, and the available water capacity is moderate. This soil has good tilth and can be tilled throughout a wide range of moisture content. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Ora, Sacul, and Savannah soils. Also included are a few areas of eroded soils.

This Smithdale soil is moderately suited to cultivated crops. Suitable crops include grain sorghum, small grains, and truck crops. Runoff is medium or rapid. Erosion is a severe hazard if this soil is used for cultivated crops. If management practices that include minimum tillage, contour farming, and terracing of the steeper slopes are used, crops that leave a large amount of residue on the surface can be grown year after year. As slope length and gradient increase, conservation treatment should be intensified.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

This Smithdale soil mainly is used as woodland. Potential productivity is moderately high for commercial wood crops. Suitable trees include loblolly pine and shortleaf pine. This soil has no significant limitations to woodland use and management.

This soil is well suited to most urban uses. Moderate permeability is a moderate limitation for septic tank absorption fields. Increasing the size of the absorption field can help to alleviate this limitation.

This soil has no significant limitations for dwellings and for local roads and streets. Slope is a moderate limitation for small commercial buildings. Designing structures to conform to the natural contour of the land can help offset this limitation.

This Smithdale soil is in capability subclass IIIe and in woodland suitability group 3o1.

77—Smithdale-Bowie-Sacul association, undulating. This map unit consists of deep, well drained and moderately well drained, gently sloping soils in the Coastal Plain. These soils formed in acid marine sediment. The Smithdale soil generally is on the more uniform slopes on the ridgetops. Bowie soil generally is in microbasins on the ridgetops and on foot slopes. Sacul soil generally is on the more dissected ridgetops and side slopes. Mapped areas are about 50 to 500 acres or more. The composition is variable; however, the detail of mapping is adequate for the expected uses of the soils. The slopes are 1 to 8 percent.

The well drained Smithdale soil makes up about 35 percent of the map unit. Typically, the surface layer is brown fine sandy loam about 7 inches thick. The subsoil is yellowish red sandy clay loam to a depth of about 42 inches and yellowish red sandy loam to a depth of 72 inches.

Smithdale soil is low in natural fertility and organic matter content. Permeability is moderate, and the available water capacity is moderate. Reaction is strongly acid to very strongly acid throughout except where the surface layer has been limed. The soil has good tilth and can be tilled within a wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

The moderately well drained Bowie soil makes up about 30 percent of this map unit. Typically, the surface layer is dark grayish brown fine sandy loam about 6 inches thick. The subsurface layer is light yellowish brown fine sandy loam to a depth of about 17 inches. The subsoil is yellowish brown sandy clay loam to a depth of about 32 inches, and yellowish brown, mottled sandy clay loam to a depth of 72 inches.

Bowie soil is low in natural fertility and organic matter content. Reaction ranges from slightly acid to strongly acid in the surface layer and is strongly acid or very strongly acid in the subsoil. Permeability is moderate, and the available water capacity is moderate. A seasonal high water table is at a depth of 36 inches from December through March. This soil has good tilth and can be tilled throughout a wide range of moisture content. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

The moderately well drained Sacul soil makes up about 25 percent of the map unit. Typically, the surface layer is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer is yellowish brown fine sandy loam to a depth of about 8 inches. The subsoil is red silty clay to a depth of about 18 inches; red, mottled silty clay to a depth of about 37 inches; yellowish red, mottled silty clay to a depth of about 55 inches; and mottled gray and yellowish red silty clay loam to a depth of 72 inches.

Sacul soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability is slow, and the available water capacity is high. A seasonal high water table is at a depth of 24 to 48 inches from December through April. This soil has good tilth, but wetness can delay tillage operations. Crops respond well to fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration.

Included in mapping are some small areas of Ruston, Ora, and Savannah soils. Also included are a few small areas of soils that have slopes of more than 8 percent.

Smithdale and Bowie soils are moderately suited to cultivated crops. Suitable crops include grain sorghum, small grains, and truck crops. Runoff is medium or rapid. Erosion is a severe hazard if these soils are used for cultivated crops. If management practices that include minimum tillage, contour farming, and terracing of the steeper slopes are used, crops that leave a large amount of residue can be safely grown year after year. As slope length and gradient increase, conservation treatment should be intensified.

Sacul soil is poorly suited to cultivated crops. Suitable crops include grain sorghum and small grains. Runoff is medium or rapid. Erosion is a very severe hazard if this soil is used for cultivated crops. If management practices that include minimum tillage, contour farming, and terracing of the steeper slopes are used, crops that leave a large amount of residue on the surface can be grown occasionally. As slope length and gradient increase, conservation treatment should be intensified.

Smithdale and Bowie soils are well suited to pasture or hay crops, and Sacul soil is moderately suited. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include deferred grazing and weed and brush control.

The soils in this map unit mainly are used as woodland. Potential productivity is moderately high for commercial wood crops. Suitable trees include loblolly pine and shortleaf pine. These soils have no significant limitations to woodland use and management. On Sacul soil, equipment limitations are moderate because of the shallow depth to the clayey subsoil. Heavy traffic on access roads and skid trails causes deep rutting.

Smithdale soil is well suited to most urban uses. Moderate permeability is a moderate limitation to use as septic tank absorption fields. Possible methods of alleviating this limitation includes increasing the size of the absorption field. This soil has no significant limitations for dwellings and local roads and streets. Slope is a moderate limitation for small commercial buildings. A design that conforms to the natural contour can help offset this limitation.

Bowie soil is moderately suited to most urban uses. Moderately slow permeability and wetness are severe limitations for septic tank absorption fields. Increasing the size of the absorption field, using a specially designed alternate system, and installing a drainage system around the perimeter helps to alleviate these limitations. This soil has no significant limitations for dwellings and for local roads and streets. Slope is a moderate limitation for small commercial buildings. Designing structures to conform to the natural contour of the land can help minimize the slope limitation.

Sacul soil is poorly suited to most urban uses. Slow permeability and wetness are severe limitations for septic tank absorption fields. These limitations are difficult and often impractical to overcome. Increasing the size of the absorption field and installing a subsurface drainage system around the perimeter can partly alleviate these limitations. High shrink-swell potential is a severe limitation for dwellings and small commercial buildings. This limitation can be partly overcome by adequately reinforcing foundations. Low strength and a high shrink-swell potential are severe limitations for local roads and streets. Adding suitable subgrade fill material to the roadbed can help to alleviate these limitations.

Smithdale soil is in the capability subclass IIIe and in woodland suitability group 3o1. Bowie soil is in capability subclass IIIe and in woodland suitability group 3o7. Sacul soil is in capability subclass IVe and in woodland suitability group 3c2.

78—Smithton very fine sandy loam, 0 to 1 percent slopes. This deep, poorly drained, level soil is on stream terraces and upland flats in the Coastal Plain. This soil is rarely flooded. The individual areas are about 5 to 50 acres.

Typically, the surface layer is dark grayish brown very fine sandy loam about 5 inches thick. The subsurface layer is light brownish gray, mottled very fine sandy loam to a depth of about 16 inches. The subsoil is light brownish gray, mottled loam to a depth of about 50 inches and grayish brown loam to a depth of 72 inches.

This soil is moderate in natural fertility and low in organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability is moderately slow, and the available water capacity is high. A seasonal high water table within 12 inches of the surface from December through May. This soil has good tilth, but wetness often delays tillage operations. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Amy, Harleston, and Stough soils. Also included are a few sandy areas. These areas occur as mounds that are about 8 feet high and about 50 feet across.

This Smithton soil is moderately suited to cultivated crops. Suitable crops include grain sorghum, small grains, and soybeans. Runoff is slow. Erosion is a slight limitation if the soil is used for cultivated crops. Tillage operations are often delayed several days after a rain if an adequate drainage system is not installed. If management practices that include minimum tillage and drainage are used, crops that leave a large amount of residue on the surface can be grown year after year.

This soil is well suited to improved pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, bahiagrass, and lespedeza. Wetness can often limit the use of some farm equipment and restrict grazing during the winter and the spring unless drainage systems are installed. Other concerns in management include drainage, rotation grazing, and weed and brush control.

This soil mainly is used as woodland. Potential productivity is high for commercial wood crops. Suitable trees include loblolly pine, cherrybark oak, Shumard oak, and sweetgum. Wetness causes moderate seedling mortality. This limitation can be minimized by planting on a raised seedbed. Because of wetness, the use of equipment is a severe limitation to woodland use and management. To offset this limitation, harvesting operations should be scheduled during dry periods.

This soil is poorly suited to most urban uses. Moderately slow permeability and wetness are severe limitations for septic tank absorption fields. These limitations are difficult and generally impractical to overcome. Increasing the size of the absorption field, using a specially designed alternate system, and installing a subsurface drainage system around the perimeter help offset these limitations.

Wetness and flooding are severe limitations for dwellings and small commercial buildings. The wetness limitation can be offset by installing surface diversions and subsurface drainage system. Flood control structures are needed to overcome the flooding limitation.

Wetness also is a severe limitation for local roads and streets. This limitation can be offset by installing a drainage system and constructing roadbeds on raised suitable subgrade fill material.

This Smithton soil is in capability subclass IIIw and in woodland suitability group 2w9.

79—Stough fine sandy loam, 0 to 2 percent slopes. This deep, somewhat poorly drained, level to nearly level soil is on stream terraces and upland flats in the Coastal Plain. This soil is rarely flooded. The individual areas are about 10 to 50 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 3 inches thick. The subsurface layer is grayish brown fine sandy loam to a depth of about 8 inches. The subsoil is mottled yellowish brown, light brownish gray, and strong brown fine sandy loam to a depth of about 22 inches; mottled light brownish gray, brownish yellow, and strong brown loam to a depth of about 48 inches; mottled gray and brownish yellow loam to a depth of about 60 inches; and mottled gray and strong brown sandy clay loam to a depth of 72 inches.

This soil is moderate in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability is moderately slow, and the available water capacity is moderate. A seasonal high water table is at a depth of 12 to 18 inches from January through April. This soil has good tilth, but wetness often delays tillage operations. Crops respond well to fertilization. The root zone is deep, but brittleness in the lower part of the subsoil can restrict root penetration.

Included with this soil in mapping are a few small areas of Amy, Savannah, and Smithton soils. Also included are a few sandy areas. These areas occur as mounds that are about 5 feet high and about 50 feet across.

This Stough soil is moderately suited to cultivated crops. Suitable crops include rice, soybeans, grain sorghum, and small grains. Wetness is the main limitation, and tillage operations are often delayed for several days after a rain if a drainage system is not installed. Runoff is slow or medium. Erosion is a slight to moderate hazard if this soil is used for cultivated crops. If management practices that include minimum tillage, drainage, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year. Crops that leave a large amount of surface residue reduce surface crusting, increase organic matter, and improve tilth.

This soil is well suited to pasture or hay crops (fig. 12). Suitable pasture plants are tall fescue, white clover, bermudagrass and bahiagrass. Wetness limits the use of some farm equipment and restricts grazing during the winter and early in the spring. Concerns in management include proper grazing as well as weed and brush control.

This soil mainly is used as woodland. Potential productivity is high for commercial wood crops. Suitable trees include loblolly pine and sweetgum. Because of wetness, the use of equipment is a moderate limitation to woodland use and management. This limitation is difficult or impractical to overcome but can be minimized by planting and harvesting during dry periods when possible.

This soil is poorly suited to most urban uses. Wetness and moderately slow permeability are severe limitations for septic tank absorption fields. This limitation is difficult to overcome. Increasing the size of the absorption field, using specially designed alternate systems, and installing a subsurface drainage system around the perimeter can help to alleviate these limitations.

Rare flooding and wetness are severe limitations for dwellings and small commercial buildings and a moderate limitation for local roads and streets. These limitations are difficult or impractical to overcome. Major flood control structures are needed to overcome the flooding limitation.

This Stough soil is in capability subclass IIw and in woodland suitability group 2w8.

80—Sumter silty clay, 3 to 12 percent slopes, eroded. This moderately deep, well drained, gently sloping to moderately sloping soil is on eroded ridges and side slopes in the Blackland Prairie. The individual areas are about 10 to 90 acres.

Typically, the surface layer is olive gray silty clay about 3 inches thick. The subsoil is olive yellow, mottled silty clay to a depth of about 14 inches; it is pale olive, mottled silty clay to a depth of about 31 inches. Below that there is soft chalk.

This soil is high in natural fertility and moderate to high in organic matter content. It is mildly alkaline or moderately alkaline and calcareous throughout.

Figure 12.—A well managed bermudagrass pasture on Stough fine sandy loam, 0 to 2 percent slopes.

Figure 13.—Past erosion is still visible on this old cropland field on Sumter silty clay, 3 to 12 percent slopes, eroded.

Permeability is slow, and the available water capacity is low. This soil shrinks and cracks when dry and expands and swells when wet. This soil has poor tilth and can be tilled only within a very narrow range of moisture content. Crops respond well to nitrogen and potash fertilization. The root zone is moderately deep, but the clayey subsoil can restrict root penetration.

Included with this soil in mapping are a few small areas of Demopolis, Houston, and Oktibbeha soils. Also included are a few areas of shallow soils in gullies.

This Sumter soil is not suited to cultivated crops. Erosion has removed most of the topsoil and a few rills have occurred. Runoff is rapid. Erosion is a very severe hazard if this soil is used for cultivated crops.

This soil is used mainly as native pasture. It is poorly suited to improved pasture (fig. 13), and it is generally not suited to hayland. Suitable improved pasture plants are bermudagrass and bahiagrass. Concerns in management include erosion control, rotation grazing, and weed and brush control.

Potential productivity is moderate for commercial wood crops. The main adapted tree is eastern redcedar. Because of the clayey surface layer, seedling mortality is severe and the use of equipment is a moderate limitation to woodland use and management. This limitation can be offset by planting and harvesting during dry periods when possible.

This soil is poorly suited to most urban uses. Depth to bedrock and slow permeability are severe limitations for septic tank absorption fields. These limitations are difficult and generally impractical to overcome. An alternate site should be selected in most cases.

High shrink-swell potential is a severe limitation for dwellings. Adequately reinforcing foundations can help offset this limitation. High shrink-swell potential and slope are severe limitations for small commercial buildings. Adequately reinforcing foundations and designing buildings to conform to the natural contour of the land can help minimize these limitations.

High shrink-swell potential and low strength are severe limitations for local roads and streets. Adding suitable subgrade fill material to the roadbed can help alleviate these limitations.

This Sumter soil is in capability subclass VIe and in woodland suitability group 4c8.

81—Sumter silty clay, 12 to 20 percent slopes, eroded. This moderately deep, well drained, moderately steep soil is on eroded side slopes in the Blackland Prairie. The individual areas are about 5 to 80 acres.

Typically, the surface layer is olive gray silty clay about 3 inches thick. The subsoil is olive yellow, mottled silty clay to a depth of about 14 inches and pale olive,

mottled silty clay to a depth of about 31 inches. Below that is soft chalk.

This soil is high in natural fertility and moderate in organic matter content. This soil is mildly alkaline or moderately alkaline and calcareous throughout. Permeability is slow, and the available water capacity is low. This soil has poor tilth and can be tilled only within a very narrow range of moisture content. Crops respond well to nitrogen and potash fertilization. The root zone is moderately deep, but the clayey subsoil restricts root penetration.

Included with this soil in mapping are a few small areas of Demopolis, Houston, and Oktibbeha soils. Also included are a few small areas of soils in gullies.

This Sumter soil is not suited to cultivated crops. Erosion has removed most of the topsoil, and a few rills have occurred. Runoff is rapid. Erosion is a very severe hazard if this soil is used for cultivated crops.

This soil is poorly suited to improved pasture. It is not suited to hay crops. Erosion has removed most of the topsoil and a few rills occur. Erosion is a very severe hazard if the surface soil is disturbed. Minimum tillage should be used in seedbed preparation for pasture. Suitable improved pasture plants are bermudagrass, tall fescue, white clover, and sericea lespedeza. This soil is well suited to native pasture. Suitable native plants are little bluestem, big bluestem, indiangrass, purpletop, and switchgrass. Concerns in management include erosion control, deferred grazing, and weed and brush control.

Potential productivity of this soil is moderate for commercial wood crops. The main adapted tree is eastern redcedar. Because of the clayey surface layer, seedling mortality is severe. Slope and the clayey surface layer are moderate limitations to use of equipment on this soil. Planting and harvesting operations should be scheduled during dry periods. Erosion is a moderate hazard.

This soil is poorly suited to most urban uses. Depth to bedrock, slow permeability, and slope are severe limitations for septic tank absorption fields. These limitations are difficult and generally impractical to overcome on this soil. An alternate site should be selected in most cases.

High shrink-swell potential and slope are severe limitations for dwellings and small commercial buildings. Adequately reinforcing foundations and designing dwellings and small commercial buildings to conform to the natural contour of the land can help offset these limitations.

Low strength, slope, and high shrink-swell potential are severe limitations for local roads and streets. Constructing roads and streets on the contour on suitable subgrade fill material can help offset these limitations.

This Sumter soil is in capability subclass VIe and in woodland group 4r9.

82—Terouge silty clay, 1 to 3 percent slopes. This deep, somewhat poorly drained, nearly level soil is on stream terraces in the Blackland Prairie. This soil is rarely flooded. The individual areas are about 5 to 70 acres.

Typically, the surface layer is very dark grayish brown, mottled silty clay about 7 inches thick. The subsurface layer is very dark grayish brown, mottled silty clay to a depth of about 22 inches. The underlying material is very dark grayish brown, mottled clay to a depth of 56 inches and dark grayish brown, mottled clay to a depth of 72 inches.

This soil is high in natural fertility and moderate in organic matter content. Reaction is slightly acid or neutral in the surface layer and in the upper part of the underlying material and ranges from neutral through moderately alkaline in the lower part of the underlying material and in the substratum. Permeability is very slow, and the available water capacity is high. This soil shrinks and cracks when dry and swells and expands when wet. A seasonal high water table is within 12 inches of the surface from December through April. Tilth is difficult to maintain, and wetness often delays tillage operations. Crops respond well to fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration.

Included with this soil in mapping are a few small areas of Houston, Una, and Tuscumbia soils. Also included are a few small areas of eroded soils.

This Terouge soil is used mainly as cropland and is well suited to this use. Suitable crops include soybeans, grain sorghum, and small grains. The clayey surface layer and wetness are the main limitations to the use of this soil for cultivated crops. Farming operations generally have to be delayed several days after a rain if surface drains are not installed. The clayey surface layer is very sticky and plastic when wet and very hard when dry. This makes tillage difficult. If management practices that include minimum tillage, drainage, and crop rotation are used, crops that leave a large amount of residue can be grown year after year.

This soil is well suited to pasture or hay crops. Wetness restricts the use of some farm equipment and limits grazing in the winter and early in the spring. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed control.

Potential productivity is moderate for commercial wood crops. The main adapted tree is eastern redcedar. Wetness causes moderate seedling mortality. This limitation is difficult and generally impractical to overcome; however, it can be partly alleviated by planting seedlings on raised seedbeds. Because of the clayey surface layer, the use of equipment is a moderate limitation to woodland use and management. Planting and harvesting operation should be scheduled during dry periods when possible.

This soil is poorly suited to most urban uses. Wetness and very slow permeability are severe limitations for septic tank absorption fields. These limitations are difficult or impractical to overcome. An alternate site should be selected in most cases, or an alternate system should be used.

Flooding, wetness, and high shrink-swell potential are severe limitations for dwellings and small commercial buildings. These limitations are difficult and generally impractical to overcome. An alternate site should be selected in most cases.

Low strength, wetness, and high shrink-swell potential are severe limitations for local roads and streets. Installing surface diversions and subsurface drainage systems and adding suitable subgrade fill material to the roadbed can help offset these limitations.

This Terouge soil is in capability subclass IIe and in woodland suitability group 4c8.

83—Terouge silty clay, occasionally flooded. This deep, somewhat poorly drained, level soil is on flood plains in the Blackland Prairie. The individual areas are about 10 to 100 acres. The slopes are 0 to 1 percent.

Typically, the surface layer is very dark grayish brown silty clay to a depth of about 7 inches. The subsurface layer is very dark grayish brown, mottled silty clay to a depth of about 22 inches. The underlying material is very dark grayish brown, mottled clay to a depth of 56 inches and dark grayish brown, mottled clay to a depth of 72 inches.

This soil is high in natural fertility and moderate in organic matter content. Reaction is slightly acid or neutral in the surface layer and in the upper part of the underlying material and ranges from neutral through moderately alkaline in the lower part of the underlying material and in the substratum. Permeability is very slow, and the available water capacity is high. This soil shrinks and cracks when dry and swells and expands when wet. A seasonal high water table is within 12 inches of the surface from December through April. Tilth is difficult to maintain, and wetness often delays tillage operations. Crops respond well to fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration.

This soil is flooded occasionally from December through May. Flooding generally lasts from 1 to 3 days. If the soil does not have vegetative cover, fast-moving floodwaters can cause severe erosion of the topsoil.

Included with this soil in mapping are a few small areas of Marietta, Una, and Tuscumbia soils. Also included are a few small areas of sandy overwash.

This Terouge soil is used mainly as cropland and is well suited to this use. Suitable crops include soybeans, grain sorghum, and small grains. Occasional flooding and wetness are the main limitations to use of this soil for cultivated crops. Farming operations generally have to be delayed several days after a rain if surface drains are not installed. The clayey surface layer is very sticky and plastic when wet and very hard when dry. This makes tillage difficult. If management practices that include minimum tillage, drainage, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year.

This soil is well suited to pasture or hay crops. Wetness restricts the use of some farm equipment and limits grazing in the winter and early in the spring. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed control.

Potential productivity is moderate for commercial wood crops. The main adapted tree is eastern redcedar. Wetness causes moderate seedling mortality. This limitation is difficult and generally impractical to overcome; however, it can be partly alleviated by planting seedlings on raised seedbeds. Because of the clayey surface layer, the use of equipment is a moderate limitation to woodland use and management. Planting and harvesting operations should be scheduled during dry periods when possible.

This soil is poorly suited to most urban uses. Flooding, wetness, and very slow permeability are severe limitations for septic tank absorption fields. These limitations are difficult or impractical to overcome. An alternate site should be selected in most cases, or an alternate system should be used.

Flooding, wetness, and high shrink-swell potential are severe limitations for dwellings and small commercial buildings. These limitations are difficult and generally impractical to overcome. An alternate site should be selected in most cases.

Low strength, wetness, and flooding are severe limitations for local roads and streets. Low strength and wetness limitations generally can be overcome by installing surface diversions and subsurface drainage systems drains and adding suitable subgrade fill material to the roadbed. Major flood control structures are needed to control the flooding limitation.

This Terouge soil is in capability subclass IIw and in woodland suitability group 4c8.

84—Toine fine sandy loam, occasionally flooded. This deep, well drained, level to nearly level soil is on flood plains and low terraces in the Ouachita Mountains and in transitional areas to the Coastal Plain. The individual areas are 5 to 100 acres. The slopes are 0 to 2 percent.

Typically, the surface layer is dark brown fine sandy loam about 6 inches thick. The subsurface layer is dark yellowish brown fine sandy loam to a depth of about 13 inches. The subsoil is dark yellowish brown sandy clay loam to a depth of about 35 inches; yellowish brown, mottled sandy clay loam to a depth of about 58 inches; and yellowish brown fine sandy loam to a depth of 72 inches.

This soil is moderate in natural fertility and low in organic matter content. Reaction ranges from strongly acid to slightly acid in the surface layer and is strongly acid or very strongly acid in the subsoil. Permeability is moderate, and the available water capacity is moderate. This soil has good tilth and can be tilled throughout a wide range of moisture content. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

This soil is flooded occasionally from December through April. Flooding generally lasts from 1 to 2 days. If the soil does not have vegetative cover, fast-moving floodwaters can cause severe erosion of the topsoil.

Included with this soil in mapping are a few small areas of Iuka, Kenn, Guyton, and Sardis soils. Also included are a few small areas of sandy or gravelly overwash.

This Toine soil is well suited to cultivated crops. Suitable crops include soybeans, grain sorghum, and small grains. Occasional flooding can delay tillage operations early in the spring. Runoff is slow. Erosion is a slight hazard if the soil is used for cultivated crops. If management practices that include minimum tillage and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year.

This soil is well suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management included deferred grazing and weed and brush control.

This Toine soil mainly is used as woodland. Potential productivity is high for commercial wood crops. Suitable trees include loblolly pine, sweetgum, American sycamore, eastern cottonwood, and cherrybark oak. This soil has no significant limitations to woodland use and management.

This soil is poorly suited to most urban uses. Occasional flooding is a severe limitation for septic tank absorption fields, dwellings and small commercial buildings, and local roads and streets. This limitation is difficult and generally impractical to overcome. Major flood control structures are needed to overcome this flooding limitation.

This Toine soil is in capability subclass IIw and in woodland suitability group 2o7.

85—Trebloc silt loam, 0 to 2 percent slopes. This deep, poorly drained, level to nearly level soil is on upland flats in the Coastal Plain and on margins of the Blackland Prairie. The individual areas are about 5 to 50 acres.

Typically, the surface layer is dark grayish brown silt loam about 6 inches thick. The subsoil is light brownish gray, mottled silty clay loam to a depth of about 37 inches; mottled gray and yellowish brown silty clay loam to a depth of about 61 inches; and mottled gray and yellowish brown silty clay to a depth of 72 inches.

This soil is moderate in natural fertility and low in organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability is slow, and the available water capacity is high. A seasonal high water table is at a depth of 6 to 12 inches from January through April. This soil has good tilth, but wetness often delays tillage operations. Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Kipling and Savannah soils.

This Trebloc soil is moderately suited to cultivated crops. Suitable crops include rice, grain sorghum, small grains, and soybeans. Runoff is slow. Erosion is a slight hazard if the soil is used for cultivated crops. Tillage operations are often delayed several days after a rain if an adequate drainage system is not installed. If management practices that include minimum tillage and drainage are used, crops that leave a large amount of residue on the surface can be grown year after year.

This soil is well suited to improved pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, bahiagrass, and lespedeza. Wetness limits the use of some farm equipment and often limits grazing during the winter and the spring unless drainage systems are installed. Concerns in management include drainage, rotation grazing, and weed and brush control.

This soil mainly is used as woodland. Potential productivity is high for commercial wood crops. Suitable trees include loblolly pine, green ash, Nuttall oak, Shumard oak, and sweetgum. Wetness causes moderate seedling mortality. This limitation can be minimized by planting on a raised seedbed. Because of wetness, the use of equipment is a severe limitation to woodland use and management. To offset this limitation, harvesting operations should be scheduled during dry periods.

This soil is poorly suited to most urban uses. Slow permeability and wetness are severe limitations for septic tank absorption fields. These limitations are difficult and generally impractical to overcome. Increasing the size of the absorption field, using a specially designed alternate system, and installing a subsurface drainage system around the perimeter can help offset these limitations.

Wetness is a severe limitation for dwellings and small commercial buildings. This limitation can be offset by installing surface diversions and a subsurface drainage system.

Wetness and low strength are severe limitations for local roads and streets. Constructing roads and streets on the contour on a raised suitable subgrade fill material can help offset these limitations.

This Trebloc soil is in capability subclass IIIw and in woodland suitability group 2w9.

86—Tuscumbia silty clay, occasionally flooded. This deep, poorly drained, level soil is on flood plains in the Blackland Prairie. The individual areas are about 10 to 100 acres. The slope is 0 to 1 percent.

Typically, the surface layer is dark grayish brown silty clay to a depth of about 7 inches. The subsoil is dark gray silty clay to a depth of about 25 inches; gray, mottled silty clay to a depth of about 56 inches; dark gray, mottled silty clay to a depth of about 68 inches; and gray, mottled clay to a depth of 72 inches.

This soil is high in natural fertility and moderate in organic matter content. Reaction ranges from medium acid to moderately alkaline throughout. Permeability is very slow, and the available water capacity is high. This soil shrinks and cracks when dry and swells and expands when wet. A seasonal high water table is at a depth of 6 to 18 inches from December through April. Tilth is difficult to maintain, and wetness often delays tillage operations (fig. 14). Crops respond well to fertilization. The root zone is deep and is easily penetrated by plant roots.

This soil is flooded occasionally from January through March. Flooding generally lasts from 1 to 3 days. If the soil does not have vegetative cover, fast-moving floodwaters can cause severe erosion of the topsoil.

Included with this soil in mapping are a few small areas of Marietta, Una, and Terouge soils. Also included are a few small areas of loamy sandy overwash.

This Tuscumbia soil is used mainly as cropland and is moderately suited to this use. Suitable crops include soybeans, grain sorghum, and small grains. Occasional flooding and wetness are the main limitations to use for cultivated crops. Farming operations generally have to be delayed several days after a rain if an adequate drainage system is not installed. The clayey surface layer is very sticky and plastic when wet and very hard when dry. This makes tillage difficult. If management practices that include minimum tillage, drainage, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year.

This soil is well suited to pasture or hay crops. Wetness restricts the use of some farm equipment and limits grazing in the winter and early in the spring. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed control.

Figure 14.—Surface drainage is needed on Tuscumbia silty clay, occasionally flooded, to remove excess surface water that often delays tillage or harvesting operations.

Potential productivity is high for commercial wood crops. Suitable trees include eastern cottonwood, sweetgum, and green ash. Wetness causes moderate seedling mortality. This limitation is difficult and generally impractical to overcome; however, it can be partly alleviated by planting seedlings on raised seedbeds. Because of wetness, the use of equipment is a severe limitation to woodland use and management. Planting and harvesting operations should be scheduled during dry periods when possible.

This soil is poorly suited to most urban uses. Flooding, wetness, and very slow permeability are severe limitations for septic tank absorption fields. These limitations are difficult or impractical to overcome. An alternate site should be selected in most cases, or a specially designed alternate system should be used.

Flooding, wetness, and high shrink-swell potential are severe limitations for dwellings and small commercial buildings. These limitations are difficult and generally impractical to overcome. An alternate site should be selected in most cases.

Low strength, wetness, and flooding are severe limitations for local roads and streets. Low strength and wetness limitations can generally be overcome by installing surface diversions and subsurface drainage systems and adding suitable subgrade fill material to the roadbed. Major flood control structures are needed to control the flooding limitation.

This Tuscumbia soil is in capability subclass IIIw and in woodland suitability group 2w9.

87—Udorthents, loamy. This map unit consists of nearly level to moderately steep soils in borrow areas. In these areas, most of the soil and underlying material has been removed, and the bedrock and the spoil from active and abandoned gravel pits and sand pits are exposed. The individual areas range from about 2 to 100 acres. The slopes are 1 to 20 percent.

These soils are scattered along the southern edge of the Ouachita Mountains where a thin layer of gravelly marine sediment was randomly deposited. Most of these areas have been mined, and the gravelly sediment has been removed down to the tilted and folded, interbedded sandstone and shale bedrock. Udorthents are a few inches to about 3 feet thick above bedrock. Further south in the Coastal Plain uplands, gravel and sand deposits have been excavated leaving open pits and altered soil material many feet thick.

Udorthents consist of soils that have been altered or obscured by mining operations. The soil material is dominantly gravelly fine sandy loam, very gravelly fine sandy loam, or extremely gravelly fine sandy loam. They range in depth from only a few inches to many feet. Gravel content ranges from 15 to 90 percent, by volume.

Soils in this map unit are low in natural fertility and organic matter content. Reaction ranges from strongly acid to extremely acid. Permeability is moderate to rapid. The available water capacity is low or very low.

Included in mapping are small areas of Saffell, Sacul, and Sherwood soils. Also included are a few areas of rock outcrops, a few areas of soil that has been smoothed and revegetated, and some open pits that have vertical sidewalls. These pits are sometimes filled with water.

These soils are not suited to cultivated crops. Slope, depth to bedrock, low or very low available water capacity, and a high gravel content are the main limitations. Erosion is a very severe hazard.

These soils are generally not suited to pasture. Some areas have been smoothed and planted to warm season perennials. Adapted pasture plants include bermudagrass, bahiagrass, and lovegrass.

These soils generally are not suited to commercial wood crops.

Udorthents generally are not suited to most urban uses. Most areas of these soils require extensive reclamation. Slope, depth to bedrock, and moderate to rapid permeability are the main limitations. An alternate site should be selected in most cases.

These soils are in capability subclass VIIe. They have not been assigned to a woodland suitability group.

88—Una silty clay loam, occasionally flooded. This deep, poorly drained, level soil is on flood plains in the Blackland Prairie. The individual areas are about 10 to 100 acres. The slopes are 0 to 1 percent.

Typically, the surface layer is grayish brown silty clay loam about 6 inches thick. The subsoil is light brownish gray, mottled silty clay to a depth of 16 inches and gray, mottled silty clay to a depth of 72 inches.

This soil is high in natural fertility and moderate in organic matter content. Reaction is very strongly acid or strongly acid throughout. Permeability is very slow, and the available water capacity is high. A seasonal high water table is at a depth of 6 to 12 inches from December through April. Tilth is difficult to maintain, and wetness often delays tillage operations. Crops respond well to fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration.

This soil is flooded occasionally from January through March. Flooding generally lasts from 1 to 3 days. If the soil does not have vegetative cover, fast-moving floodwaters can cause severe erosion of the topsoil.

Included with this soil in mapping are a few small areas of Marietta, Urbo, Terouge, and Tuscumbia soils.

This Una soil is used mainly as cropland and is moderately suited to this use. Suitable crops include rice, soybeans, grain sorghum, and small grains. Occasional flooding and wetness are the main limitations to use of this soil for cultivated crops. Farming operations generally have to be delayed several days after a rain if an adequate drainage system is not installed. If management practices that include minimum tillage,

drainage, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year.

This soil is well suited to pasture or hay crops. Wetness restricts the use of some farm equipment and limits grazing in the winter and early in the spring. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed control.

Potential productivity is high for commercial wood crops. Suitable trees include Nuttall oak, sweetgum, green ash, and water tupelo. Wetness causes moderate seedling mortality. Planting seedlings on raised seedbed can help offset this limitation. Because of wetness, the use of equipment is a severe limitation to woodland use and management. Heavy traffic on access roads and skid trails causes deep rutting. Planting and harvesting operations should be scheduled during dry periods when possible.

This soil is poorly suited to most urban uses. Flooding, wetness, and very slow permeability are severe limitations for septic tank absorption fields. These limitations are difficult or impractical to overcome. In most cases, an alternate site should be selected, or a specially designed alternate system should be used.

Flooding, wetness, and high shrink-swell potential are severe limitations for dwellings and small commercial buildings. These limitations are difficult and generally impractical to overcome. An alternate site should be selected in most cases.

Low strength, wetness, and flooding are severe limitations for local roads and streets. Low strength and wetness limitations can generally be overcome by installing surface diversions and subsurface drainage systems and adding suitable subgrade fill material to the roadbed. Major flood control structures are needed to control the flooding limitation.

This Una soil is in capability subclass IIIw and in woodland suitability group 2w9.

89—Urbo silty clay loam, occasionally flooded. This deep, somewhat poorly drained, level soil is on flood plains in the Blackland Prairie. The individual areas are about 20 to 100 acres. The slopes are 0 to 1 percent.

Typically, the surface layer is dark brown silty clay loam about 4 inches thick. The subsurface layer is dark grayish brown, mottled silty clay to a depth of about 7 inches. The subsoil is grayish brown, mottled clay loam to a depth of about 15 inches; light brownish gray, mottled clay loam to a depth of about 45 inches; and light brownish gray, mottled clay to a depth of 72 inches.

This soil is high in natural fertility and moderate in organic matter content. Reaction is very strongly acid or strongly acid throughout. Permeability is very slow, and the available water capacity is high. A seasonal high water table is at a depth of 12 to 24 inches from January through March. Tilth is difficult to maintain, and wetness often delays tillage operations. Crops respond well to fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration.

This soil is flooded occasionally from January through April. Flooding generally lasts from 1 to 3 days. If the soil does not have vegetative cover, fast-moving floodwaters can cause severe erosion of the topsoil.

Included with this soil in mapping are a few small areas of Marietta, Una, Terouge, and Tuscumbia soils. Also included are a few small areas of sandy overwash.

This Urbo soil is used mainly as cropland and is well suited to this use. Suitable crops include soybeans (fig. 15), grain sorghum, and small grains. Occasional flooding and wetness are the main limitations to use of this soil for cultivated crops. Farming operations generally have to be delayed several days after a rain if an adequate drainage system is not installed. If management practices that include minimum tillage, drainage, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year.

This soil is well suited to pasture or hay crops. Wetness restricts the use of some farm equipment and limits grazing in the winter and early in the spring. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed control.

Potential productivity is very high for commercial wood crops. Suitable trees include eastern cottonwood, sweetgum, loblolly pine, and American sycamore. Wetness causes moderate seedling mortality. Planting seedlings on raised seedbeds can help offset this limitation. Depth to the clayey subsoil and wetness moderately limits the use of equipment for woodland use and management. Heavy traffic on access roads and skid trails causes deep rutting. Planting and harvesting operation should be scheduled during dry periods when possible.

This soil is poorly suited to most urban uses. Flooding, wetness, and very slow permeability are severe limitations for septic tank absorption fields. These limitations are difficult or impractical to overcome. In most cases, an alternate site should be selected or a specially designed alternate system should be used.

Flooding and wetness are severe limitations for dwellings and small commercial buildings. These limitations are difficult and generally impractical to overcome. An alternate site should be selected in most cases.

Low strength and flooding are severe limitations for local roads and streets. Low strength limitation generally can be overcome by adding suitable subgrade fill material to the roadbed. Major flood control structures are needed to control the flooding limitation.

This Urbo soil is in capability subclass IIw and in woodland suitability group 1w5.

Figure 15.—Soybeans consistently have high yields on Urbo silty clay loam, occasionally flooded.

90—Wilcox silt loam, 1 to 3 percent slopes. This deep, somewhat poorly drained, nearly level soil is on broad hilltops in the Coastal Plain. The individual areas are about 5 to 50 acres.

Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The subsoil is yellowish red, mottled clay to a depth of about 13 inches; mottled yellowish red, light brownish gray, and yellowish brown clay to a depth of about 25 inches; gray, mottled silty clay to a depth of about 37 inches; and light brownish gray, mottled silty clay to a depth of about 52 inches. The underlying material is light brownish gray, mottled silty clay to a depth of about 62 inches. Below that, there is light brownish gray clayey shale to a depth of 72 inches.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid to extremely acid throughout. Permeability is slow, and the available water capacity is high. A seasonal high water table is at a depth of 18 to 36 inches from January through April. This soil has good tilth, but wetness often delays tillage operations. Crops respond well to fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration.

Included with this soil in mapping are a few small areas of Mayhew, Sacul, Kipling, and Oktibbeha soils. Also included are a few small areas of soils that have slopes of more than 3 percent.

This Wilcox soil is moderately suited to cultivated crops. Suitable crops include grain sorghum, soybeans, and small grains. Runoff is slow or medium. Erosion is a slight to moderate hazard if this soil is used for cultivated crops. If management practices that include minimum tillage, contour farming, drainage, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year. As slope length and gradient increase, conservation treatment should be intensified.

This soil is moderately suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

This soil mainly is used as woodland. Potential productivity is moderately high for commercial wood products. Suitable trees include loblolly pine and shortleaf pine. Equipment limitations are moderate because of the shallow depth to the clayey subsoil. Heavy traffic on access roads and skid trails causes deep rutting (fig. 16).

This soil is poorly suited to most urban uses. Slow permeability and wetness are severe limitations for septic tank absorption fields. These limitations are difficult and generally impractical to overcome. Using a specially designed alternate system and installing a subsurface drainage system around the perimeter can help to alleviate these limitations.

High shrink-swell potential is a severe limitation for dwellings and small commercial buildings. This limitation can be partly overcome by adequately reinforcing foundations.

Low strength and high shrink-swell potential are severe limitations for local roads and streets. These limitations can be partly alleviated by adding suitable subgrade fill material to the roadbed.

This Wilcox soil is in capability subclass IIIw and in woodland suitability group 3c2.

91—Wilcox silt loam, 3 to 8 percent slopes. This deep, somewhat poorly drained, gently sloping soil is on side slopes in the Coastal Plain. The individual areas are about 5 to 80 acres.

Figure 16.—Equipment limitations for managing wood crops are moderate on Wilcox silt loam, 1 to 3 percent slopes. Heavy traffic on access roads and skid trails causes deep rutting.

Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The subsoil is yellowish red, mottled clay to a depth of about 13 inches; mottled yellowish red, light brownish gray, and yellowish brown clay to a depth of about 25 inches; gray, mottled silty clay to a depth of about 37 inches; and light brownish gray, mottled silty clay to a depth of about 52 inches. The underlying material is light brownish gray, mottled silty clay to a depth of about 62 inches. Below that is light brownish gray clayey shale to a depth of 72 inches.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid to extremely acid throughout. Permeability is slow, and the available water capacity is high. A seasonally high water table is at a depth of 18 to 36 inches from January through April. This soil has good tilth, but wetness often delays tillage operations. Crops respond well to fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration.

Included with this soil in mapping are a few small areas of Oktibbeha, Kipling, and Sacul soils. Also included are a few areas of eroded soils.

This Wilcox soil is poorly suited to cultivated crops, although grain sorghum and small grains can be grown. Runoff is rapid. Erosion is a very severe hazard if the soil is used for cultivated crops. If management practices that include minimum tillage, contour farming, terracing of the steeper slopes, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown occasionally. A close-growing cover crop should be kept on this soil most of the time. As slope length and gradient increase, conservation treatment should be intensified.

This soil is moderately suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover, bermudagrass, and bahiagrass. Concerns in management include rotation grazing and weed and brush control.

This soil mainly is used as woodland. Potential productivity is moderately high for commercial wood products. Suitable trees include loblolly pine and shortleaf pine. Equipment limitations are moderate because of the shallow depth to the clayey subsoil. Heavy traffic on access roads and skid trails causes deep rutting.

This soil is poorly suited to most urban uses. Slow permeability and wetness are severe limitations for septic tank absorption fields. These limitations are difficult and often impractical to overcome. Using a specially designed alternate system and installing a subsurface drainage system around the perimeter can partly alleviate these limitations.

High shrink-swell potential is a severe limitation for dwellings and small commercial buildings. Adequately reinforcing foundations can help to overcome this limitation.

Low strength and a high shrink-swell potential are severe limitations for local roads and streets. Adding suitable subgrade fill material to the roadbed can help alleviate these limitations.

This Wilcox soil is in capability subclass IVe and in woodland suitability group 3c2.

92—Wing Variant fine sandy loam, 0 to 2 percent slopes. This deep, somewhat poorly drained, level to nearly level soil is on stream terraces and upland flats in the Ouachita Mountains. The slopes are smooth and convex. The individual areas are about 5 to 40 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 3 inches thick. The subsurface layer is yellowish brown, mottled fine sandy loam to a depth of about 10 inches. The subsoil is light brownish gray, mottled loam to a depth of about 20 inches, and mottled, light brownish gray and yellowish brown clay loam to a depth of about 45 inches. Below that is weakly cemented, tilted and fractured, mildly alkaline shale.

This soil is moderate in natural fertility and low in organic matter content. A high concentration of sodium that can be toxic to plant roots is in the middle and lower parts of the subsoil. Reaction ranges from very strongly acid to neutral in the surface and subsurface layers and ranges from medium acid to moderately alkaline in the subsoil and in the underlying material. Permeability is very slow, and the available water capacity is low. A seasonal high water table is within 12 inches of the surface from December through March. This soil has good tilth and can be tilled throughout a wide range of moisture content. Shaping and levelling can bring parts of the subsoil that are high in sodium to the surface. Soils in these areas will have very poor tilth because of dispersion that is caused by a high concentration of sodium. Before shaping or levelling operations are started, an investigation should be made to determine where this high concentration of sodium is in the soil layers. The root zone is only moderately deep, and roots can only penetrate down to the upper part of the subsoil because of the sodium concentration in the lower layers. This soil is commonly droughty.

Included with this soil in mapping are a few small areas of Bonnerdale, Pirum, and Toine soils. Also included are a few areas of soils that have slick spots.

This Wing Variant soil is moderately suited to cultivated crops. Suitable crops include rice, soybeans, grain sorghum, and small grains. Runoff is slow. Water often ponds on the flatter and depressional parts of the soil. A high sodium concentration in the subsoil can reduce yields unless the soil is irrigated and the crops rotated. If management practices that include drainage, irrigation, minimum tillage, and crop rotation are used, crops that leave a large amount of residue on the surface can be grown year after year.

This soil is moderately suited to pasture or hay crops. Suitable pasture plants are tall fescue, white clover,

bermudagrass, and bahiagrass. Concerns in management include deferred grazing and weed control.

This soil mainly is used as woodland. Potential productivity is moderate for commercial wood products. Suitable trees include loblolly pine, sweetgum, and American sycamore. Seedling mortality and restricted use of equipment are moderate limitations to woodland use and management. Planting on a raised seedbed and scheduling harvesting operations during dry periods help minimize these limitations.

This soil is poorly suited to most urban uses. Very slow permeability and wetness are severe limitations for septic tank absorption fields. These limitations are difficult and often impractical to overcome. Using a specially designed alternate system and installing a subsurface drainage system around the perimeter can help offset these limitations.

Wetness is a severe limitation for dwellings and small commercial buildings. Surface diversions and a subsurface drainage system can partly alleviate the wetness limitation.

Wetness and low strength are severe limitations for local roads and streets. Constructing roads and streets on raised suitable subgrade fill material may be necessary to minimize the severity of these limitations.

This Wing Variant soil is in capability subclass IIIw and in woodland suitability group 4w8.

93—Yanush-Ceda complex, 0 to 8 percent slopes. This map unit consists of deep, well drained, level to gently sloping soils in narrow valleys between paralleling ridges in the Ouachita Mountains. Areas of these soils are so narrow that it was not practical to separate them at the scale selected for mapping. Yanush soil is on foot slopes. Ceda soil is on flood plains of very small drainage areas. Mapped areas are long and narrow and range from about 10 to 100 acres. The individual areas are about 5 acres.

Yanush soil makes up about 55 percent of the map unit. Typically, the surface layer is dark brown very cherty silt loam about 5 inches thick. The subsurface layer is strong brown very cherty silty loam to a depth of about 15 inches. The subsoil is red very cherty silty clay loam to a depth of about 34 inches and red extremely cherty silty clay loam to a depth of about 65 inches. Below that is massive chert and novaculite bedrock that has lenses of shale and sandstone.

Yanush soil is low in natural fertility and organic matter content. Reaction is medium acid or slightly acid in the surface layer. It ranges from medium acid to very strongly acid in the subsurface layer and in the subsoil. Permeability is moderate, and the available water capacity is moderate. Pastures respond well to fertilization. This soil has good tilth, but the very cherty surface layer impedes tillage operations. The root zone is deep and is easily penetrated by plant roots.

Ceda soil makes up about 20 percent of the map unit. Typically, the surface layer is dark grayish brown very cherty fine sandy loam about 7 inches thick. The subsurface layer is brown very cherty fine sandy loam to a depth of about 17 inches. The underlying material is yellowish brown very cherty loam to a depth of about 50 inches and yellowish brown extremely cherty loam to a depth of 72 inches.

Ceda soil is moderate in natural fertility and low in organic matter content. Reaction is slightly acid or medium acid throughout. Permeability is rapid, and the available water capacity is low. Pastures respond well to fertilization. The very cherty surface impedes tillage operations. The root zone is deep and is easily penetrated by plant roots.

Ceda soil is on narrow flood plains generally 20 to 300 feet wide of very small drainage areas. This soil is flooded frequently for brief periods from January through July. Flooding lasts from 1 to 4 hours.

Included in mapping are some small areas of Kenn, Toine, and Carnasaw soils. Toine soils are on flood plains and terraces. Carnasaw soils are on foot slopes. Also included are a few soils on foot slopes that have slopes of more than 8 percent. The included soils make up 25 percent of this map unit.

The soils in this map unit are poorly suited to crops, although grain sorghum and small grains can be grown. Slope, rapid runoff, and low available water capacity are the main limitations. Erosion is a very severe hazard. Surface chert hinders some tillage operations. If management practices that include minimum tillage and crop rotations are used, crops that leave a large amount of residue on the surface can be grown occasionally. A close-growing cover crop should be kept on the soil most of the time.

Yanush and Ceda soils are moderately suited to pasture. Suitable pasture plants are bermudagrass, bahiagrass, and tall fescue. The very cherty surface layer restricts the use of some mowing equipment and causes difficulty in establishing adequate stands. Other management concerns include rotation grazing and brush and weed control.

The soils in this map unit mainly are used as woodland. Potential productivity is moderate for commercial wood crops on Yanush soil and moderately high on Ceda soils. Suitable trees include loblolly pine, shortleaf pine, American sycamore, and sweetgum. The very cherty surface layer causes moderate seedling mortality on the soils in this complex.

Yanush soil is well suited to moderately suited to most urban uses. Permeability is a moderate limitation to use as septic tank absorption fields. This soil has no significant limitations to use as sites for dwellings and for local roads and streets. Slope is a moderate limitation for small commercial buildings.

Ceda soil is poorly suited to most urban uses. Flooding and rapid permeability are severe limitations for septic

tank absorption fields. Flooding is a severe limitation for dwellings and small commercial buildings and for local roads and streets.

Moderate permeability limitation for septic tank absorption fields on Yanush soil generally can be offset by increasing the size of the absorption field. Rapid permeability and poor filtering capacity limitations of Ceda soil are difficult to overcome. Using a specially designed alternate system and modifying the septic tank absorption fields can help offset the permeability and poor filtering capacity limitations. Slope limitations may require extensive cut and fill operations. Designing structures to conform to the natural contour of the land can help minimize this limitation. Major flood control structures are needed to overcome the flooding limitations.

The soils in this map unit are in capability subclass IVe. Yanush soil is in woodland suitability group 4f8. Ceda soil is in woodland suitability group 3f8.

94—Yanush-Carnasaw-Bigfork complex, 8 to 20 percent slopes. This map unit consists of deep and moderately deep, well drained, moderately sloping to moderately steep soils on side slopes in the Ouachita Mountains. Areas of these soils are so intricately mixed or so small that it was not practical to separate them at the scale selected for mapping. Mapped areas range from about 50 to 1,000 acres or more. The individual areas are about 3 to 5 acres.

The deep Yanush soil makes up about 35 percent of the map unit. Typically, the surface layer is dark brown very cherty silt loam about 5 inches thick. The subsurface layer is strong brown very cherty silt loam to a depth of about 15 inches. The subsoil is red very cherty silty clay loam to a depth of about 34 inches and red extremely cherty silty clay loam to a depth of 65 inches. Below that is massive chert and novaculite bedrock that has lenses of shale and sandstone.

Yanush soil is low in natural fertility and organic matter content. Reaction is slightly acid or medium acid in the surface layer and ranges from medium acid to very strongly acid in the subsurface layer and in the subsoil. Permeability is moderate, and the available water capacity is moderate. The root zone is deep, but the cherty subsoil restricts root penetration.

The deep Carnasaw soil makes up about 35 percent of the map unit. Typically, the surface layer is dark brown gravelly silt loam about 4 inches thick. The subsoil is yellowish red silty clay to a depth of about 15 inches and red silty clay to a depth of about 51 inches. The underlying material is weakly cemented, tilted and fractured shale bedrock that has thin layers of sandstone.

Carnasaw soil is low in natural fertility and organic matter content. Reaction ranges from very strongly acid to medium acid in the surface layer. It is very strongly acid or strongly acid in the subsoil. Permeability is slow, and the available water capacity is moderate. Pasture plants respond well to fertilization. The root zone is deep, but the clayey subsoil restricts root penetration.

The moderately deep Bigfork soil makes up about 20 percent of the map unit. Typically, the surface layer is very dark grayish brown very cherty silty loam about 5 inches thick. The subsoil is yellowish brown very cherty silty clay loam to a depth of about 12 inches and yellowish red very cherty silty clay loam to a depth of about 26 inches. Below that is tilted and fractured chert and novaculite bedrock that has lenses of shale and sandstone.

Bigfork soil is low in natural fertility and organic matter content. Reaction ranges from slightly acid to strongly acid in the surface layer and from medium acid to very strongly acid in the subsoil. Permeability is moderate, and the available water capacity is low. The root zone is moderately deep, but root penetration is difficult because of the high chert content.

Included in mapping are small areas of rock outcrop and small areas of soils that are similar to Carnasaw soil but are mottled in the lower part of the subsoil. Also included are a few small areas of soils that have slopes of more than 20 percent. The included soils make up 10 percent of this map unit.

The soils in this map unit are not suited to cultivated crops. The slope, rapid runoff, and surface chert are the main limitations. The hazard of erosion is very high.

Yanush and Carnasaw soils are moderately suited to pasture. Bigfork soil is poorly suited to pasture. The Bigfork soil is droughty because of the low available water capacity. Suitable pasture plants are bermudagrass, bahiagrass, and tall fescue. Concerns in management include rotation grazing and weed and brush control.

The soils in this map unit mainly are used as woodland. Potential productivity is moderate for commercial wood crops on Yanush soil, moderately high on Carnasaw soil, and low on Bigfork soil. Suitable trees include shortleaf pine and loblolly pine. Seedling mortality is a moderate limitation because of the content of chert fragments in the surface layer of Yanush and Bigfork soils. Carnasaw soil has no significant limitations to woodland use and management.

Yanush soil is moderately suited to most urban uses. Moderate permeability and slope are moderate limitations for septic tank absorption fields. Slope is a moderate limitation for dwellings and for local roads and streets. Slope is a severe limitation for small commercial buildings.

Carnasaw soil is poorly suited to most urban uses. Slow permeability is a severe limitation for septic tank absorption fields. High shrink-swell potential is a severe limitation for dwellings. High shrink-swell potential and slope are severe limitations for small commercial buildings. Low strength and high shrink-swell potential are severe limitations for local roads and streets.

Bigfork soil is poorly suited to most urban uses. Depth to bedrock is a severe limitation for septic tank absorption fields. Slope and depth to bedrock are moderate limitations for dwellings and for local roads and streets. Slope is a severe limitation for small commercial buildings.

Depth to bedrock limitations for septic tank absorption fields are difficult and generally impractical to overcome on the soils in this map unit. An alternate site should be selected in most cases. Permeability limitations for septic tank absorption fields also are difficult to overcome. These limitations can be offset by increasing the size of the absorption field or by using a specially designed alternate system.

Slope limitations for dwellings and small commercial buildings often require extensive cut and fill operations. An alternative is to design dwellings and commercial buildings to conform to the natural contour of the land. Depth to bedrock limitations for dwellings and small commercial buildings may require building structures above the bedrock and adding fill material when landscaping the area. High shrink-swell limitations for dwellings and small commercial buildings generally can be overcome by adequately reinforcing foundations.

The high shrink-swell potential and low strength limitations for local roads and streets generally can be offset by adding suitable subgrade fill material to the roadbed. The slope limitation generally can be offset by constructing streets and roads on the contour and adapting the design to the slope. Depth to bedrock limitations can require special planning as to proper location for streets and roads and removal of rock. Some areas will require blasting.

The soils in this map unit are in capability subclass VIe. Yanush soil is in woodland suitability group 4f8. Carnasaw soil is in woodland suitability group 3o7. Bigfork soil is in woodland suitability group 5f8.

95—Yanush-Bigfork-Carnasaw complex, 20 to 40 percent slopes. This map unit consists of deep and moderately deep, well drained, steep soils on side slopes in the Ouachita Mountains. Areas of these soils are so intricately mixed or so small that it was not practical to separate them at the scale selected for mapping. Mapped areas range from about 50 to 1,000 acres or more. The individual areas are about 3 to 5 acres.

The deep Yanush soil makes up about 35 percent of the map unit. Typically, the surface layer is dark brown very cherty silt loam about 5 inches thick. The subsurface layer is strong brown very cherty silt loam to a depth of about 15 inches. The subsoil is red very cherty silty clay loam to a depth of about 34 inches and red extremely cherty silty clay loam to a depth of 65 inches. The layer below that consists of massive chert and novaculite bedrock, which has lenses of shale and sandstone.

Yanush soil is low in natural fertility and organic matter content. Reaction is slightly acid or medium acid in the surface layer. It ranges from medium acid to very strongly acid in the subsurface layer and in the subsoil. Permeability is moderate, and the available water capacity is moderate. The root zone is deep, but the cherty subsoil can restrict root penetration.

The moderately deep Bigfork soil makes up about 30 percent of the map unit. Typically, the surface layer is very dark grayish brown very cherty silt loam about 5 inches thick. The subsoil is yellowish brown very cherty silty clay loam to a depth of about 26 inches. The layer below that consists of tilted and fractured chert and novaculite bedrock, which has lenses of shale and sandstone.

Bigfork soil is low in natural fertility and organic matter content. Reaction ranges from slightly acid to strongly acid in the surface layer and ranges from medium acid to very strongly acid in the subsoil. Permeability is moderate, and the available water capacity is low. The root zone is moderately deep, but the high chert content can restrict root penetration.

The deep Carnasaw soil makes up about 25 percent of the map unit. Typically, the surface layer is dark brown gravelly silt loam about 4 inches thick. The subsoil is yellowish red silty clay to a depth of about 15 inches and red silty clay to a depth of about 51 inches. The underlying material is weakly cemented, tilted and fractured shale bedrock that has thin layers of sandstone.

Carnasaw soil is low in natural fertility and organic matter content. Reaction ranges from very strongly acid to medium acid in the surface layer and is very strongly acid or strongly acid in the subsoil. Permeability is slow, and the available water capacity is moderate. Pastures respond well to fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration.

Included in mapping are small areas of rock outcrop and soils that are similar to the Carnasaw soils but are more shallow to bedrock. Also included are a few small areas of soils that have slopes of less than 20 percent and a few small areas that have slopes of more than 40 percent. The included soils make up 10 percent of this map unit.

The soils in this map unit are not suited to cultivated crops or improved pasture. Slope, rapid runoff, and surface chert are the main limitations. Erosion is a very high hazard.

The soils in this map unit mainly are used as woodland. Potential productivity is moderate on Yanush soils for commercial wood crops, moderately high on Carnasaw soil, and low on Bigfork soil. Suitable trees include shortleaf pine and loblolly pine. Seedling mortality is a moderate limitation because of the content of chert fragments in the surface layer of Yanush and Bigfork soils. Restricted use of equipment is a limitation

to woodland use and management. Erosion is a very severe hazard.

The soils in this complex are poorly suited to most urban uses. On Yanush soil, slope is a severe limitation for septic tank absorption fields, dwellings and small commercial buildings, and local roads and streets.

On Bigfork soil, depth to bedrock and slope are severe limitations for septic tank absorption fields. Slope is a severe limitation for dwellings and small commercial buildings and for local roads and streets.

On Carnasaw soil, slow permeability and slope are severe limitations for septic tank absorption field. Slope and high shrink-swell potential are severe limitations for dwellings and small commercial buildings. Low strength, high shrink-swell potential, and slope are severe limitations for local roads and streets.

Depth to bedrock, slope, and slow permeability limitations for septic tank absorption fields are difficult and generally impractical to overcome on the soils in this map unit. An alternate site should be selected in most cases.

Slope limitations for dwellings and small commercial buildings and for local roads and streets also are difficult to overcome. Designing structures to conform to the natural contour of the land can help minimize this limitation. High shrink-swell potential limitations for dwellings and small commercial buildings generally can be overcome by adequately reinforcing foundations.

High shrink-swell potential and low strength limitations for local roads and streets generally can be offset by adding suitable subgrade fill material to the roadbed.

The soils in this map unit are in capability subclass VIIe. Yanush soil is in woodland suitability group 4f8. Bigfork soil is in woodland suitability group 5f8. Carnasaw soil is in woodland suitability group 3r8.

96—Zafra-Carnasaw-Pirum complex, 8 to 20 percent slopes. This map unit consists of deep and moderately deep, well drained, moderately sloping to moderately steep soils on side slopes in the Ouachita Mountains. Areas of these soils are so intricately mixed or so small that it was not practical to separate them at the scale selected for mapping. Mapped areas range from about 50 to 1,000 acres or more. The individual areas are about 3 to 5 acres.

The moderately deep to deep Zafra soil makes up about 30 percent of the map unit. Typically, the surface layer is dark grayish brown stony fine sandy loam about 5 inches thick. The subsurface layer is yellowish brown very gravelly fine sandy loam to a depth of about 9 inches. The subsoil is yellowish brown very gravelly loam to a depth of about 12 inches and yellowish red very gravelly sandy clay loam to a depth of about 31 inches. The underlying material is tilted and fractured, soft sandstone that has lenses of shale to a depth of about 33 inches. Below that is tilted and fractured, hard sandstone that has lenses of shale.

Zafra soil is low in natural fertility and organic matter content. Reaction is strongly acid or medium acid in the surface and subsurface layers and is very strongly acid in the subsoil. Permeability is moderate, and the available water capacity is low. Pastures respond well to fertilization. The root zone is moderately deep to deep and is easily penetrated by plant root.

The deep Carnasaw soil makes up about 25 percent of the map unit. Typically, the surface layer is dark brown gravelly silt loam about 4 inches thick. The subsoil is yellowish red silty clay to a depth of about 15 inches and red silty clay to a depth of about 51 inches. The underlying material is weakly cemented, tilted and fractured shale bedrock that has thin layers of sandstone.

Carnasaw soil is low in natural fertility and organic matter content. Reaction ranges from very strongly acid to medium acid in the surface layer and is very strongly acid or strongly acid in the subsoil. Permeability is slow, and the available water capacity is moderate. Pastures respond well to fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration.

The deep to moderately deep Pirum soil makes up about 25 percent of the map unit. Typically, the surface layer is dark grayish brown gravelly fine sandy loam about 5 inches thick. The subsoil is brownish yellow gravelly fine sandy loam to a depth of about 10 inches and yellowish brown gravelly loam to a depth of about 42 inches. Below that is hard, tilted and fractured sandstone bedrock that has lenses of shale.

Pirum soil is low in natural fertility and organic matter content. Reaction ranges from medium acid to very strongly acid throughout. Permeability is moderate, and the available water capacity is moderate. Crops respond well to fertilization. The root zone is moderately deep and is easily penetrated by plant roots.

Included in mapping are small areas of Bismarck, Clebit, Sherless, and Sherwood soils in positions on the landscape similar to those of the soils in this complex. Also included are some areas of Toine soils that parallel the drainageways. The included soils make up 20 percent of this map unit.

The soils in this map unit are not suited to cultivated crops. Slope, surface stones, low available water capacity, and rapid runoff are the main limitations. Erosion is a very severe hazard.

Carnasaw and Pirum soils are moderately suited to pasture and Zafra soil is poorly suited. Suitable pasture plants are bermudagrass, bahiagrass, clover, lespedeza, and fescue. Zafra soil is droughty because of the low available water capacity. Surface stones restrict the use of some mowing and bush-hog equipment. Other management concerns include proper grazing and weed and brush control.

The soils in this map unit mainly are used as woodland. Potential productivity is moderately high for commercial wood crops on Carnasaw and Pirum soils

and moderate on Zafra soil. Suitable trees include loblolly pine, shortleaf pine, and southern red oak. Carnasaw and Pirum soils have no significant limitations to woodland use and management. Surface stones cause moderate equipment limitations on Zafra soil.

Zafra and Pirum soils are moderately suited to poorly suited to most urban uses. Depth to bedrock is a severe limitation for septic tank absorption fields. Depth to bedrock and slope are moderate limitations for dwellings and for local roads and streets. Slope is a severe limitation for small commercial buildings.

Carnasaw soil is poorly suited to most urban uses. Slow permeability is a severe limitation for septic tank absorption fields. High shrink-swell potential is a severe limitation for dwellings. Slope and high shrink-swell potential are severe limitations for small commercial buildings. Low strength and a high shrink-swell potential are severe limitations for local roads and streets.

Depth to bedrock limitations for septic tank absorption fields are difficult and generally impractical to overcome on the soils in this map unit. An alternate site should be selected in most cases. Permeability limitations for septic tank absorption fields are also difficult to overcome. Increasing the size of the absorption field or using a specially designed alternate system help offset these limitations.

Slope limitations for dwellings and small commercial buildings often require extensive cut and fill operations. An alternative is to design structures to conform to the natural contour of the land. Depth to bedrock limitations for dwellings and small commercial buildings can require that structures be built above the bedrock and fill material be added when landscaping the area. Shrink-swell limitations for dwellings and small commercial buildings can generally be overcome by adequately reinforcing foundations.

High shrink-swell potential and low strength limitations for local roads and streets generally can be offset by adding suitable subgrade fill material to the roadbed. Depth to bedrock limitation can require special planning as to proper location for streets and roads and proper grading of the sites to avoid the unnecessary removal of rock. Some areas will require blasting. Slope limitations generally can be offset by constructing on the contour and adapting the design to the slope.

The soils in this map unit are in capability subclass VIs. Zafra soil is in woodland suitability group 4x8. Carnasaw and Pirum soils are in woodland suitability group 3o7.

97—Zafra-Carnasaw-Clebit complex, 20 to 40 percent slopes. This map unit consists of deep, moderately deep, and shallow, well drained, moderately sloping to moderately steep soils on side slopes in the Ouachita Mountains. Areas of these soils are so intricately mixed or so small that it was not practical to separate them at the scale selected for mapping. Mapped areas range from 80 to 1,000 acres or more. The individual areas are about 3 to 5 acres.

The moderately deep to deep Zafra soil makes up about 35 percent of the map unit. Typically, the surface layer is dark grayish brown stony fine sandy loam about 5 inches thick. The subsurface layer is yellowish brown very gravelly fine sandy loam to a depth of about 9 inches. The subsoil is yellowish brown very gravelly loam to a depth of about 12 inches and yellowish red very gravelly sandy clay loam to a depth of about 31 inches. The underlying material is tilted and fractured, soft sandstone that has lenses of shale to a depth of about 33 inches. Below that is tilted and fractured, hard sandstone that has lenses of shale.

Zafra soil is low in natural fertility and organic matter content. Reaction is strongly acid or medium acid in the surface and subsurface layers and is very strongly acid in the subsoil. Permeability is moderate, and the available water capacity is low. Pastures respond well to fertilization. The root zone is moderately deep to deep and is easily penetrated by plant root.

The deep Carnasaw soil makes up about 25 percent of the map unit. Typically, the surface layer is dark brown gravelly silt loam about 4 inches thick. The subsoil is yellowish red silty clay to a depth of about 15 inches and red silty clay to a depth of about 51 inches. The underlying material is weakly cemented, tilted and fractured shale bedrock that has thin layers of sandstone.

Carnasaw soil is low in natural fertility and organic matter content. Reaction ranges from very strongly acid to medium acid in the surface layer and is very strongly acid or strongly acid in the subsoil. Permeability is slow, and the available water capacity is moderate. Pastures respond well to fertilization. The root zone is deep, but the clayey subsoil can restrict root penetration.

The shallow Clebit soil makes up about 25 percent of the map unit. Typically, the surface layer is dark grayish brown stony fine sandy loam about 6 inches thick. The subsoil is yellowish brown very gravelly fine sandy loam to a depth of about 17 inches. Below that is hard, tilted and fractured sandstone bedrock.

Clebit soil is low in natural fertility and organic matter content. Reaction ranges from slightly acid to strongly acid in the surface layer and ranges from slightly acid to very strongly acid in the subsoil. Permeability is moderately rapid, and the available water capacity is very low. The root zone is shallow.

Included in mapping are small areas of Bismarck, Pirum, and Sherwood soils that are in similar positions as the soils in this complex. Also included are areas of Toine soils paralleling drainageways, a few areas of rock outcrops (fig. 17), and a few areas of soils that have slopes of more than 40 percent. The included soils make up 15 percent of this map unit.

Figure 17.—Rock outcrops are common on foot slopes in this map unit and are included in mapping of the Zafra-Carnasaw-Clebit complex, 20 to 40 percent slopes.

The soils in this map unit are not suited to cultivated crops or improved pasture. Slope, surface stones, low available water capacity, rapid runoff, and depth to bedrock are the main limitations. Erosion is a very severe hazard.

The soils in this Zafra-Carnasaw-Clebit map unit mainly are used as woodland. Potential productivity is moderately high for commercial wood crops on Carnasaw soil, moderate on Zafra soil, and low on Clebit soil. Suitable trees include loblolly pine, shortleaf pine, and southern red oak. Slope is a moderate limitation to use of equipment. Because of surface stones, equipment use on Zafra and Clebit soils is a moderate limitation. Erosion is a moderate hazard on these soils because of slope. Seedling mortality is a moderate limitation because of the shallow root zone of Clebit soil.

The soils in this complex are poorly suited to most urban uses. On Carnasaw soil, slow permeability and slope are severe limitations for septic tank absorption fields. High shrink-swell potential and slope are severe limitations for dwellings and small commercial buildings. Low strength, slope, and high shrink-swell potential are severe limitations for local roads and streets.

On Zafra and Clebit soils, depth to bedrock and slope are severe limitations for septic tank absorption fields. On Zafra soil, slope is a severe limitation for dwellings and small commercial buildings and for local roads and streets. On Clebit soil, depth to bedrock and slope are severe limitations for dwellings and small commercial buildings and for local roads and streets.

Depth to bedrock limitations for septic tank absorption fields are difficult and generally impractical to overcome on the soils in this map unit. An alternate site should be selected in most cases. Permeability and slope limitations for septic tank absorption fields are also difficult to overcome. Increasing the size of the absorption field or using a specially designed alternate system help offset these limitations.

Slope limitations of these soils for dwellings and small commercial buildings often require extensive cut and fill operations. An alternative is to design structures to conform to the natural contour of the land. High shrink-swell limitations for dwellings and small commercial

buildings generally can be overcome by adequately reinforcing foundations. High shrink-swell potential and low strength limitations for local roads and streets generally can be offset by adding suitable subgrade fill material to the roadbed. Slope limitations generally can be offset by constructing streets and roads on the contour and adapting the design to the slope. Depth to bedrock limitations can require special planning as to proper location for streets and roads and proper grading of sites to avoid the unnecessary removal of rock. Some areas will require blasting.

The soils in this map unit are in capability subclass VIIs. Zafra soil is in woodland suitability group 4x8. Carnasaw soil is in woodland suitability group 3r8. Clebit soil is in woodland suitability group 5x8.to overcome.

Prime Farmland

In this section, prime farmland is defined and discussed, and the prime farmland soils in Clark and Hot Spring Counties are listed in table 7.

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

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

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

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

About 277,785 acres in Clark County, or about 49 percent of the county, is prime farmland. These soils are scattered throughout the county. On the uplands, these soils are on the nearly level to gently sloping ridgetops and in the valleys. Most of this acreage is used for forage and timber production. The remainder of the prime farmland is in the bottom lands and on terraces scattered throughout the county. Most of this acreage is used for row crops, forage, and timber production. The prime farmland soils in Clark County are mainly in general soil map units 5, 6, 7, and 8.

About 129,655 acres in Hot Spring County, or about 33 percent of the county, is prime farmland. These soils are dominantly on the east side of the county. On the uplands, these soils are on nearly level to gently sloping ridgetops and in the valleys. Most of this acreage is used for forage and timber production. The remainder of the prime farmland is on flood plains and terraces of the Ouachita River and other perennial streams. The areas that are used for row crops are mainly in general soil map units 7 and 8.

A continuing trend in Clark and Hot Spring Counties is the conversion of some prime farmland to urban use, especially around the major towns. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are less productive than prime farmland because they are more erodible, droughty, or difficult to cultivate.

The map units, or soils, that make up prime farmland in Clark and Hot Spring Counties are listed in table 7. The location of each map unit is shown on the detailed soil maps at the back of this publication. The extent of each unit is given in table 6. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units." This list does not constitute a recommendation for a particular land use.

Soils that have limitations, such as a high water table or flooding, may qualify as prime farmland if these limitations are overcome by such measures as drainage or flood control. Onsite evaluation is necessary to determine if the limitations have been overcome by the corrective measures. Detailed information on the criteria for prime farmland can be obtained from the local office of the Soil Conservation service.

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 avoid 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 behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis for predicting soil behavior.

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

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

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

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

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

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

About 46,000 acres was used for harvested crops in Clark County in 1978 according to the Census of Agriculture *(11)*. About 60,500 acres was used for pasture. Of that acreage, about 29,000 acres was cropland that was used as pasture; about 14,000 acres was in other improved and unimproved pasture, and about 17,500 acres was in woodland pasture. An additional 4,000 acres was idle or in cover crops.

In Hot Spring County, about 13,500 acres was used for harvested crops in 1978, and about 48,000 acres was used as pasture. Of the pasture acreage, about 24,000 acres was cropland that was used as pasture; about 12,000 acres was in other improved and unimproved pasture, and about 12,000 acres was in woodland pasture. An additional 2,000 acres was idle or in cover crops.

Most cleared land in the counties was used for pasture and hay. The acreage of row crops is generally small. The areas of soils that are well suited to row crops are primarily on flood plains and terraces along the rivers and major creeks and on a few small nearly level to gently sloping upland areas. Crops suited to these areas are soybeans, corn, grain sorghum, and small grains. A few areas are well suited to rice production. Some of the gently sloping to moderately sloping soils on uplands are moderately suited to drilled or sown crops, mainly oats, wheat, and grain sorghum.

Most soils in the Ouachita Mountain area of Clark and Hot Spring Counties are poorly suited to not suited to intensive use for crops because of surface stoniness, slope, shallow depth to bedrock, high content of coarse fragments in the soil, or a combination of these limitations.

Most soils in the Blackland Prairie area of Clark County are poorly suited to not suited to intensive use for crops because of past erosion, slope, and shallow depth to marl or chalk, or a combination of these limitations.

Soils in the Coastal Plain area of Clark and Hot Spring Counties are well suited to not suited to intensive use for crops depending on slope and drainage. Contour

farming, vegetated waterways, and terraces are needed on sloping soils that are used for tilled crops. Annual cover crops or grasses and legumes should be grown regularly in the cropping system if the hazard of erosion is severe or very severe.

Contour cultivation, grassed waterways, minimum tillage, and terraces are needed on sloping soils that are used for tilled crops. Annual cover crops or grasses and legumes should be grown regularly in the cropping system if the hazard of erosion is severe or very severe or if the main season crops leave only a small amount of residue on the soil.

Most of the soils tend to pack and crust after heavy rains if they are left without vegetative protection. Growing cover crops and managing crop residue help to maintain good tilth. Crop residue should be shredded and spread evenly to provide a protective cover and add organic matter to the soil. Minimum tillage should be practiced to the extent practical for soil condition and the crop requirement.

In general, the soils in the Ouachita Mountains and the Coastal Plain areas are low in nitrogen, potassium, phosphorus, calcium, and organic matter. The soils in the Blackland Prairie generally are low in available phosphorus. The kinds and amounts of fertilizer applied are generally based on soil tests, crops to be grown, past experience, capability of the soil to produce, and expected yields. On most soils, lime as indicated by soil tests helps most crops, and it is generally necessary for satisfactory production of such crops as alfalfa, white clover, red clover, vegetables, and other specialty crops.

Perennial grasses or mixtures of grasses and legumes are grown for pasture and hay. Mixtures generally consist of either a warm-season or a cool-season perennial grass and a suitable legume.

Common and hybrid bermudagrasses are the most commonly grown pasture and hay crops in Clark and Hot Spring Counties. These are warm-season plants propagated by sprigging or by sprigging and seeding in the case of common bermudagrass. Bermudagrass generally is sprigged because stands started by seeding are more susceptible to winter-kill. White clover is the most commonly grown legume. Alfalfa is suited to the fertile, well drained Ouachita soils on flood plains and terraces along the Ouachita, Caddo, Antoine, and Little Missouri Rivers.

Under good pasture management, proper grazing is essential for the production of high quality forage, stand survival, and erosion control. Proper grazing helps plants maintain sufficient and generally vigorous topgrowth during the growing season. Management includes restricted grazing of tall fescue and other cool-season grasses during the hot, dry summer. Brush control is essential, and weed control is generally needed. Rotation grazing and renovation are also important management practices.

Pasture grasses respond well to nitrogen fertilizer. Grass and legume mixtures require phosphate, potash, and lime at rates based on soil test results.

Small acreages are in commercial and home orchards and home gardens. Although the acreage and cash income from these enterprises are small, they are important. Most farm families and many urban families can and freeze homegrown fruit and vegetables for home use. Specialty crops, such as watermelons, strawberries, tomatoes, and sweet corn, are grown for cash sales at local farmers' markets.

Yields Per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 8. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

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

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that insures 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 table 8 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for use as cropland. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major, and generally expensive, landforming that would change slope, depth,

or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey. These levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

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

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

Class V soils are not likely to erode, but they have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w,* or *s,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless a close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); and *s* shows that the soil is limited mainly because it is shallow, droughty, or stony.

There are no subclasses in class I because the soils of this class have few limitations. The soils in class V are subject to little or no erosion, but they have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation. Class V contains only the subclasses indicated by *w* or *s*. The capability classification of each map unit is given in the section "Detailed Soil Map Units."

Woodland Management and Productivity

Kelly M. Koonce, forester, Soil Conservation Service, helped prepare this section.

Originally, the land area of Clark and Hot Spring Counties was woodland. The only exceptions were the river sandbars, a few scattered savannas of native grasses, and rock outcrops.

Managed stands of commercial trees are in both counties, but most are producing below their potential. About 270,000 acres, or 68 percent of the total area of Hot Spring County, is in woodland.

- About 145,000 acres is owned by the forest industry
- about 118,000 acres is in private ownership
- about 7,000 acres is publicly owned.

About 420,000 acres, or 74 percent of the total area of Clark County, is in woodland.

- About 165,000 acres is owned by the forest industry
- about 245,000 acres is privately owned
- about 10,000 acres is publicly owned.

The wood products industry is one of the major industries in Clark and Hot Spring Counties. The 19 wood products mills in these counties produce everything from fence post to saw logs.

Other benefits of woodland include grazing for domestic animals, habitat for wildlife, recreation and esthetic value, and conservation of soil and water.

Table 9 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the woodland suitability group for each soil. Soils assigned the same woodland suitability group require the same general management and have about the same productivity.

The first part of the *symbol*, a number, indicates the productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *x* indicates stoniness or rockiness; *w*, excessive water in or on the soil; *d*, restricted root depth; *c*, clay in the upper part of the soil; *s*, sandy texture; *f*, high content of coarse fragments in the soil profile; and *r*, steep slopes. The letter *o* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: x, w, d, c, s, f, and r.

The third element in the symbol, a numeral, indicates the kind of trees for which the soils in the group are best suited and also indicates the severity of the hazard or limitation. Only erosion hazard, equipment limitation, and seedling mortality are considered in making the following ratings. The numerals 1, 2, and 3 indicate slight, moderate, and severe limitations, respectively, and suitability for needle-leaved trees. The numerals 4, 5,

and 6 indicate slight, moderate, and severe limitations, respectively, and suitability for broad-leaved trees. The numerals 7, 8, and 9 indicate slight, moderate, and severe limitations, respectively, and suitability for both needle-leaved and broad-leaved trees.

In table 9, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Ratings of the *erosion hazard* indicate the risk of loss of soil in a well-managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or in equipment; and *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree to which the soil affects the mortality of tree seedlings. Plant competition is not considered in the ratings. The ratings apply to seedlings from good stock that are properly planted during a period of sufficient rainfall. A rating of *slight* indicates that the expected mortality is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

Ratings of *windthrow hazard* are based on soil characteristics that affect the development of tree roots and the ability of the soil to hold trees firmly. A rating of *slight* indicates that few trees may be blown down by strong winds; *moderate*, that some trees will be blown down during periods of excessive soil wetness and strong winds; and *severe*, that many trees are blown down during periods of excessive soil wetness and moderate or strong winds.

Ratings of *plant competition* indicate the degree to which undesirable plants are expected to invade where there are openings in the tree canopy. The invading plants compete with native plants or planted seedlings. A rating of *slight* indicates little or no competition from other plants; *moderate* indicates that plant competition is expected to hinder the development of a fully stocked stand of desirable trees; *severe* indicates that plant competition is expected to prevent the establishment of a desirable stand unless the site is intensively prepared, weeded, or otherwise managed to control undesirable plants.

The *productivity* of merchantable or *common trees* on a soil is expressed as a *site index*. This 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 woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Recreation

In table 10, the soils of the survey area are rated according to the limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 10, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 10 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 13 and interpretations for dwellings without basements and for local roads and streets in table 12.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have gentle slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

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

stones, or boulders that increase the cost of shaping sites or of building access roads and parking areas.

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

Wildlife Habitat

By Paul Brady, biologist, Soil Conservation Service, helped prepare this section.

Clark and Hot Spring Counties are primarily woodland and pastoral areas of clean, pleasant scenery and abundant habitat for wildlife.

About 72 percent, or 690,000 acres, is forested with oak-hickory climax forest on uplands and oak-gum climax forest on lowlands. Shortleaf pine, loblolly pine, and eastern redcedar are the native evergreens.

About 11 percent of this survey area, or 110,000 acres, is pasture, hayland, and forage areas. Common bermudagrass, bahiagrass, and tall fescue are the major pasture grasses. Other significant grasses and legumes are coastal bermudagrass, Alicia bermudagrass, white clover, and annual lespedeza.

Major crops grown on the 60,000 acres of cropland in the two counties are soybeans, rice, and wheat.

Major plant groups and species that are important to wildlife in Clark and Hot Spring Counties include oaks, hickories, dogwoods, hawthorns, shortleaf pine, loblolly pine, redcedar, blackberry, elderberry, viburnums, sumacs, greenbriers, honeysuckles, wheat, bahiagrass, bluestems, fescue, clovers, annual lespedeza, panicums, partridge pea, common ragweed, tickclovers, and vetches.

The abundant forests of hardwoods and evergreens, interspersed pastures, fence rows, and numerous edges provide extensive habitats for white-tailed deer, squirrels, wild turkey, bobwhite quail, raccoons, rabbits, coyotes, opossums, foxes, and a multitude of nongame birds, small mammals, reptiles, and amphibians.

Clark and Hot Spring Counties have an estimated 1,400 ponds covering about 400 acres. These ponds are used primarily for stock watering and sport fishing for largemouth bass, bluegills, redear, sunfish, and channel catfish. These species and striped bass, smallmouth bass, crappies, shad, and other species are in DeGray Lake (13,400 acres) and in a part of Lake Catherine (2,180 acres) in these counties.

About 235 miles of fishable streams are in these two counties. The larger and most important streams are the Ouachita River, Caddo River, Little Missouri River, Antoine River, and Terre Moire Creek. These streams provide habitat for largemouth bass, spotted bass, smallmouth bass, rock bass, white sucker, bluegill, green sunfish, sculpins, and other warm- and cool-water species.

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 11, 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 flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, grain sorghum, 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, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, lovegrass, bermudagrass, 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 flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, cheatgrass, goldenrod, beggarweed, partridge pea, and tickclover.

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, the available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, grape, hawthorn, dogwood, hickory, and blackberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Amur honeysuckle, bicolor lespedeza, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, cypress, and cedar.

Wetland plants are annual and perennial, wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, 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. The wildlife attracted to these areas include bobwhite quail, meadowlark, field sparrow, cottontail, and red fox.

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

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, mink, and beaver.

Engineering

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

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations must be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of absorbed 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 alternate 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 12 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, and local roads and streets. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, 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 the 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, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 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.

Sanitary Facilities

Table 13 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome, *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 13 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and that good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, 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.

Table 13 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 due to rapid permeability of 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 needs to be considered.

The ratings in table 13 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 type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type 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 soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 14 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 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, 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 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 the depth to the water table is 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. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 14, 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 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 15 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and for embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives the restrictive features that affect each soil for drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable

compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to 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, or 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 to 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 reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind 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 to 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 or 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. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps.

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 characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 16 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture *(7)*. 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 as much as 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system *(2)* and the system adopted by the American Association of State Highway and Transportation Officials *(1)*.

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

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20, or higher, for the poorest.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area, or from nearby areas, and on field examination.

Physical and Chemical Properties

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

Clay as a soil separate, or component, consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to absorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water 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, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage in each major soil layer is stated in inches of water per inch of soil. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion. Losses are expressed in tons per acre per year. These estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

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

Organic matter is the plant and animal residue in the soil at various stages of decomposition.

In table 17, 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 of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity,

infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

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

Hydrologic soil groups are used to estimate runoff from precipitation. Soils are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, 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 high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary covering of the soil surface by flowing water, is caused by overflowing streams, by runoff from adjacent slopes, or by inflow from high tides. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding, Standing water in swamps and marshes or in a closed depreciation is considered ponding.

Table 18 gives the frequency and duration of flooding and the time of year when flooding is most likely to occur.

Frequency, duration, and probable dates of occurrence are estimated. Frequency generally is expressed as *none, rare, occasional,* or *frequent. None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (there is a near 0 to 5 percent chance of flooding in any year). *occasional* means that flooding occurs infrequently under normal weather conditions (there is a 5 to 50 percent chance of flooding in any year). *Frequent* means that flooding occurs often under normal weather conditions (there is more than a 50 percent chance of flooding in any year). Duration is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* more than 1 month). The time of year that floods are most likely to occur is expressed in months. November-May, for example, means that flooding can occur during the period November through May. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information on flooding is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons, which are characteristic of soils that are not subject to flooding.

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.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 18 are the depth to the seasonal high water table; the kind of water table, that is, *perched* or *apparent;* and the months of the year that the water table commonly is highest. A water table that is seasonally high for less than 1 month is not indicated in table 18.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched; water table is separated from a lower one by a dry zone.

The two numbers in the "High water table-Depth" column indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that the water table exists for less than a month.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severely corrosive environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and the amount of sulfates in the saturation extract.

Physical and Chemical Analyses of Selected Soils

The results of physical analysis of several typical pedons in the survey area are given in table 19 and the results of chemical analysis in table 20. The data are for soils sampled at carefully selected sites. The pedons are typical of the series and are described in the section "Soil Series and Their Morphology." Soil samples were analyzed by the University of Arkansas at Fayetteville, Arkansas.

Most determinations, except those for grain-size analysis and bulk density, were made on soil material smaller than 2 millimeters in diameter. Measurements reported as percent or quantity of unit weight were calculated on an oven-dry basis. The methods used in obtaining the data are indicated in the list that follows. Silt and clay particle-size distribution was determined by hydrometer method *(4)*. The codes in parentheses refer to published methods *(8)*.

Sand—(0.05-2.0 mm fraction) weight percentages of materials less than 2 mm (3A1).

Organic matter—dry combustion (6A2b).

Extractable bases—ammonium acetate pH 7.0, uncorrected; calcium (6N2e), magnesium (602d), sodium (6P2b), potassium (6Q2b).

Extractable acidity—barium chloride-triethanolamine I (6H1a).

Cation-exchange capacity—sum of cations (5A3a).

Base saturation—sum of cations, TEA, pH 8.2 (5C3).

Reaction (pH)—1:1 water dilution (8C1a).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(9)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or on laboratory measurements. Table 21 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Ten 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 Entisol.

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 Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplaquents (*Hapl*, meaning minimal horizonation, plus *aquent*, the suborder of the Entisols that have an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Haplaquents.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine, mixed, acid, thermic Typic Haplaquents.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. There can be some variation in the texture of the surface layer or of the substratum within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other 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 (7)*. Many of the technical terms used in the descriptions are defined in *Soil Taxonomy (9)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Adaton Series

The Adaton series consists of deep, poorly drained, slowly permeable soils that formed in loamy alluvial sediment. This alluvial sediment has a high content of silt. These level soils are on stream terraces in the Coastal Plain. An apparent high water table is at the surface or within a depth of 6 inches from January through April. Flooding can occur during periods of abnormally heavy rainfall. The native vegetation is mixed hardwoods and pines. Slopes are 0 to 1 percent.

Adaton soils are associated with Amy and Gurdon soils. Amy soils are in similar positions on the landscape

as the Adaton soils but contain less clay in the subsoil and have a lower base saturation. Gurdon soils are on slightly higher terraces. They have a coarse-silty control section, are somewhat poorly drained, and have a lower base saturation.

Typical pedon of Adaton silt loam, 0 to 1 percent slopes, in a wooded area; NW1/4SE1/4SW1/4 sec. 15, T. 7 S., R. 19 W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; common medium distinct yellowish brown (10YR 5/4) mottles; moderate medium granular structure; very friable; many fine and medium roots; common iron-manganese concretions; very strongly acid; clear smooth boundary.

Btg1—4 to 8 inches; light brownish gray (10YR 6/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; thin patchy clay film on faces of peds; friable; many fine and medium roots, common iron-manganese concretions; very strongly acid; clear smooth boundary.

Btg2—8 to 30 inches; light brownish gray (10YR 6/2) silty clay loam; common medium distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; thick patchy clay film on faces of peds; few fine roots; few fine pores; common iron-manganese concretions; very strongly acid; clear smooth boundary.

Btg3—30 to 58 inches; gray (10YR 6/1) silty clay loam; common medium distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; thick patchy clay film on faces of peds; few fine roots; few fine pores; common iron-manganese concretions; very strongly acid; gradual wavy boundary.

Btg4—58 to 72 inches; gray (10YR 6/1) silty clay; common medium distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; thick patchy clay film on faces of peds; few fine roots; few fine pores; few pressure faces; common iron-manganese concretions; very strongly acid.

The thickness of the solum is more than 60 inches. Reaction is strongly acid or very strongly acid throughout.

The Ap horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4; or hue of 2.5Y, value of 4 to 6, and chroma of 2 or 4. In uncultivated areas, a thin A horizon that is less than 6 inches thick has hue of 10YR, value of 3 or 4, and chroma of 1 or 2.

The Btg horizon has hue of 10YR, value of 4 to 7, and chroma of 1; has hue of 2.5Y or 10YR, value of 5 or 6, and chroma of 2; or it is neutral and has value of 4 to 7. Mottles in shades of yellow and brown range from few to many and are less than 40 percent of the mass. Texture is silt loam or silty clay loam in the upper part of the Btg horizon and includes silty clay in the lower part. Clay content in the upper 20 inches of the Btg horizon ranges from 20 to 35 percent.

Amy Series

The Amy series consists of deep, poorly drained, slowly permeable soils that formed in silty alluvium. These level to nearly level soils are on stream terraces in the Coastal Plain. A perched high water table is at the surface or within a depth of 12 inches from December through April. Flooding can occur during periods of abnormally heavy rainfall. The native vegetation is mixed hardwoods and pines. Slopes are 0 to 2 percent.

Amy soils are associated with Adaton, Foley, and Gurdon soils. Adaton soils are in similar positions on the landscape as the Amy soils, but they have more clay in the subsoil and have a higher base saturation. Foley soils are in slightly higher positions on the landscape than Amy soils and have a higher base saturation. Gurdon soils are on slightly higher terraces, have a coarse-silty control section, and are somewhat poorly drained.

Typical pedon of Amy silt loam, 0 to 2 percent slopes, in a wooded area; SE1/4SE1/4SE1/4 sec. 34, T. 8 S., R. 18 W.

A—0 to 6 inches; grayish brown (10YR 5/2) silt loam; moderate medium granular structure; friable; many fine and medium roots; common iron-manganese concretions; strongly acid; clear smooth boundary.

Eg—6 to 21 inches; light brownish gray (10YR 6/2) silt loam; few fine faint brown and few medium distinct yellowish brown (10YR 5/4) mottles; weak medium granular structure; friable; many fine and medium roots; common iron-manganese concretions; strongly acid; clear smooth boundary.

Btg1—21 to 53 inches; gray (10YR 5/1) silty clay loam; common medium distinct yellowish brown (10YR 5/4) mottles; moderate medium subangular blocky structure; firm; thick patchy clay film on faces of peds; few fine roots; common iron-manganese concretions; very strongly acid; gradual smooth boundary.

Btg2—53 to 72 inches; gray (10YR 5/1) silty clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; thick patchy clay film on faces of peds; few fine roots; common iron-manganese concretions; very strongly acid.

The thickness of the solum ranges from 40 to 72 inches. Reaction is strongly or very strongly acid throughout.

The A horizon has hue of 10YR, value of 4, and chroma of 1 or 2; or hue of 10YR, value of 5, and chroma of 2. In some pedons an A horizon that is less

than 6 inches thick has hue of 10YR, value of 3, and chroma of 2.

The Eg horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2; or hue of 10YR, value of 5, and chroma of 2. This horizon has mottles in shades of brown. Texture is silt loam, loam, or very fine sandy loam.

The Btg horizon has hue of 10YR, value of 5, and chroma of 1; hue of 10YR, value of 6 or 7, and chroma of 1 or 2; or hue of 2.5Y, value of 6, and chroma of 2. This horizon has mottles in shades of brown. Texture of the B horizon is silt loam or silty clay loam.

The Cg horizon, if present, has the same color range as the B horizon. Texture is silt loam, silty clay loam, or fine sandy loam.

Avilla Series

The Avilla series consists of deep, well drained, moderately permeable soils that formed in loamy alluvium of acid sandstone and shale. These gently sloping soils are on stream terraces in the Ouachita Mountains. In most areas of these soils, flooding can occur during periods of abnormally heavy rainfall. The native vegetation is pines and mixed hardwoods. Slopes are 3 to 8 percent.

Avilla soils are associated with Shermore, Sherwood, and Toine soils. Shermore soils are on higher foot slopes and fans than the Avilla soils, have a higher base saturation, and have a fragipan. Sherwood soils are in higher positions on the landscape and are less than 60 inches deep to hard sandstone bedrock. Toine soils are on flood plains and low terraces, have a higher base saturation, and have a yellowish brown, mottled subsoil.

Typical pedon of Avilla fine sandy loam, 3 to 8 percent slopes, in an idle field; SE1/4NE1/4NE1/4 sec. 33, T. 5 S., R. 22 W.

Ap1—0 to 3 inches; brown (10YR 4/3) fine sandy loam; weak medium granular structure; very friable; common fine and medium roots; about 2 percent, by volume, rounded sandstone gravel; strongly acid; clear boundary.

Ap2—3 to 10 inches; yellowish brown (10YR 5/4) fine sandy loam; moderate medium granular structure; very friable; common fine and medium roots; about 2 percent, by volume, rounded sandstone gravel; very strongly acid; clear smooth boundary.

Bt1—10 to 23 inches; strong brown (7.5YR 5/6) loam; weak medium subangular blocky structure; friable; common fine roots; about 3 percent, by volume, rounded sandstone gravel; patchy clay film on faces of peds; very strongly acid; clear wavy boundary.

Bt2—23 to 41 inches; yellowish red (5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; few fine roots; about 3 percent, by volume, rounded sandstone gravel; patchy clay film on faces of peds; very strongly acid; gradual wavy boundary.

Bt3—41 to 72 inches; yellowish red (5YR 4/8) sandy clay loam that has common medium distinct red (2.5YR 4/8), common medium prominent light yellowish brown (10YR 6/4), and few fine prominent light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; friable; about 5 percent, by volume, rounded sandstone gravel; patchy clay film on faces of peds; very strongly acid.

The thickness of the solum ranges from 60 to 85 inches. Reaction is strongly acid or very strongly acid throughout.

The A or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. Some pedons have an A horizon, 2 to 4 inches thick, that has hue of 10YR, value of 3, and chroma of 1 or 2. Coarse fragments, 2 to 75 millimeters across, range from 1 to 15 percent, by volume.

The BE horizon, if present, has hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 4 or 6; or hue of 5 YR or 7.5YR, value of 5 or 6, and chroma of 8. Texture is loam or fine sandy loam. The Bt1 horizon has hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 4 or 6; or hue of 5YR or 7.5YR, value of 5 or 6, and chroma of 8. The Bt2 and Bt3 horizons have hue of 5YR or 2.5YR, value of 4 to 6, and chroma of 4, 6, or 8. Many pedons do not have a dominant matrix color and are mottled in shades of brown, red, yellow, and gray below a depth of 30 inches. Texture of the Bt horizon is loam, clay loam, or sandy clay loam. Coarse fragments, 2 to 75 millimeters across, range from 1 to 15 percent, by volume. Some pedons have a BC horizon at a depth of more than 60 inches. Colors are similar to those of the Bt2 and Bt3 horizons. Texture is gravelly loam, gravelly clay loam, gravelly sandy clay loam, or their very gravelly analogs. Coarse fragments, 2 to 75 millimeters across, range from 15 to 60 percent, by volume.

Bigfork Series

The Bigfork series consists of moderately deep, well drained, moderately permeable soils that formed in residuum of chert and novaculite that has intrusions of sandstone and shale. These gently sloping to very steep soils are on ridgetops and side slopes of the Ouachita Mountains. The native vegetation is low quality pines and mixed hardwoods that have an understory of prairie grasses. Slopes are 3 to 60 percent.

Bigfork soils are associated with Carnasaw and Yanush soils. Carnasaw soils are on the lower side slopes and in the valleys. These soils have a clayey control section, and they developed from shale. Yanush soils are on side slopes and foot slopes. They have a higher base saturation than Bigfork soils and are more than 60 inches deep to bedrock.

Typical pedon of Bigfork very cherty silt loam, in a wooded area of Bigfork-Rock outcrop complex, 3 to 8 percent slopes; SW1/4SE1/4SW1/4 sec. 15, T. 4 S., R. 18 W.

A—0 to 5 inches; very dark grayish brown (10YR 3/2) very cherty silt loam; moderate medium granular structure; friable; common fine and medium roots; about 35 percent, by volume, chert fragments 0.5 inch to about 6 inches across; medium acid; abrupt smooth boundary.

Bt1—5 to 12 inches; yellowish brown (10YR 5/6) very cherty silty clay loam; moderate medium subangular blocky structure; friable; common fine and medium roots; thin patchy clay film on faces of peds and on rock surfaces; about 45 percent, by volume, chert fragments 0.5 inch to about 6 inches across; medium acid; clear smooth boundary.

Bt2—12 to 18 inches; yellowish red (5YR 5/6) very cherty silty clay loam; moderate medium subangular blocky structure; friable; few fine and medium roots; thin patchy clay film on faces of peds and on rock surfaces; about 45 percent, by volume, chert fragments 0.5 inch to about 8 inches across, medium acid; clear smooth boundary.

Bt3—18 to 26 inches; yellowish red (5YR 5/6) very cherty silty clay loam; moderate medium subangular blocky structure; friable; few fine and medium roots; thin patchy clay film on faces of peds and on rock surfaces; about 55 percent, by volume, chert fragments 0.5 inch to about 12 inches across; medium acid; abrupt irregular boundary.

R—26 to 30 inches; tilted and fractured, hard chert and novaculite that has layers of shale and sandstone.

The thickness of the solum and the depth to hard bedrock range from 20 to 50 inches and are extremely variable over short distances. The content of chert fragments ranges from 35 to 60 percent in the A horizon and from 35 to 75 percent in the B horizon. Reaction ranges from strongly acid to slightly acid in the A and E horizons and ranges from very strongly acid to medium acid in the Bt horizon.

The A horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 or 4; or hue of 10YR, value of 3 to 5, and chroma of 3. If the A horizon has a moist value of 3, it is less than 6 inches thick.

The E horizon, if present, has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. Texture is very cherty silt loam, very cherty loam, or their extremely cherty analogs.

The Bt horizon has hue of 5YR, 7.5YR, or 10YR, value of 3 to 5, and chroma of 4 or 6; or hue of 5YR, 7.5YR, or 10YR, value of 5, and chroma of 8. Texture is very cherty clay loam, very cherty silty clay loam, or their extremely cherty analogs.

The R horizon is hard chert or novaculite that is tilted 20 to 60 degrees from the horizontal and has layers of sandstone and shale.

Bismarck Series

The Bismarck series consists of shallow, somewhat excessively drained, moderately permeable soils that formed in residuum of tilted and fractured shale that has intrusions of sandstone. These gently sloping to steep soils are on the lower side slopes and in the valleys of the Ouachita Mountains. The native vegetation is post oak, eastern redcedar, and pines. Slopes are 3 to 40 percent.

Bismarck soils are associated with Carnasaw, Pirum, Sherless, Sherwood, and Zafra soils. Carnasaw soils are in similar positions on the landscape as the Bismarck soils, have a clayey control section, and are more than 40 inches deep to bedrock. Pirum, Sherless, and Sherwood soils are in higher positions on the landscape. Also Pirum and Sherwood soils have a fine-loamy control section and are more than 20 inches deep to hard bedrock, and Sherless soils have a fine-loamy control section and are more than 20 inches deep to soft bedrock. Zafra soils are on side slopes, have an argillic horizon, and are more than 25 inches deep to hard sandstone bedrock.

Typical pedon of Bismarck very shaly loam, 3 to 12 percent slopes, in a native pasture area; SE1/4SE1/4NE1/4 sec. 11, T. 3 S., R. 18 W.

Ap—0 to 3 inches; dark brown (10YR 3/3) very shaly loam; moderate medium granular structure; friable; common fine and medium roots; 45 percent, by volume, shale fragments less than 3 inches across; 3 percent, by volume, sandstone cobbles, 3 to 6 inches across, on the surface; strongly acid; clear smooth boundary.

E—3 to 7 inches; brown (10YR 4/3) very shaly loam; weak medium subangular blocky structure; friable; common fine and medium roots; 55 percent, by volume, shale fragments; strongly acid; clear smooth boundary.

Bw—7 to 14 inches; yellowish brown (10YR 5/4) extremely shaly loam; weak medium subangular blocky structure; friable; few fine roots; 75 percent, by volume, shale fragments; strongly acid; abrupt irregular boundary.

Cr—14 to 20 inches; very dark gray, brown, and red, weakly cemented, fractured, acid shale containing less than 5 percent yellowish brown (10YR 5/4) silt loam coatings on shale fragments; shale bed dip 50 degrees from the horizontal.

The thickness of the solum and the depth to shale range from 10 to 20 inches. Reaction ranges from medium acid to very strongly acid throughout.

The A or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 to 4; or hue of 7.5YR, value of 3 or 4, and chroma of 2 or 4. Shale and sandstone fragment content ranges from 35 to 60 percent, by volume. Fragments that are more than 3 inches across are less than 5 percent of the volume.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4; or hue of 7.5YR, value of 4 or 5, and chroma of 4. The fine-earth fraction is silt loam or loam or their shaly, very shaly, and gravelly analogs. Shale and sandstone fragment content ranges from 35 to 60 percent, by volume. Fragments that are more than 3 inches across are less than 5 percent of the volume.

The Bw horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. The fine-earth fraction is silt loam or loam or their very shaly or extremely shaly analogs. Shale and sandstone fragment content ranges from 35 to 85 percent, by volume. Fragments more than 3 inches across are less than 10 percent of the volume.

The Cr horizon is gray, brown, and red, soft, weakly cemented, acid shale that has a few thin strata of interbedded sandstone and siltstone. Fines are less than 5 percent of the volume. Shale beds are fractured, and the bed dip ranges from 35 degrees to near vertical.

Bonnerdale Series

The Bonnerdale series consists of deep, somewhat poorly drained, moderately permeable soils that formed in loamy sediment underlain by weakly cemented, tilted shale that has thin strata of interbedded sandstone. These level to gently sloping soils are in valleys and on slightly concave uplands of the Ouachita Mountains. A perched high water table is at a depth of about 6 to 12 inches from December through May. The native vegetation is pines and mixed hardwoods. Slopes are 0 to 5 percent.

Bonnerdale soils are associated with Bismarck, Carnasaw, Pirum, Sherless, and Wing Variant soils. Bismarck soils are in slightly higher positions on the landscape than the Bonnerdale soils, have a loamy-skeletal control section, and are less than 20 inches deep to soft, interbedded shale and sandstone. Carnasaw soils are on side slopes, have a clayey control section, and are well drained. Pirum soils are on ridges, have a fine-loamy control section, and are 22 to 50 inches deep to hard sandstone. Sherless soils are on lower ridgetops and side slopes, have a fine-loamy control section, and are 20 to 40 inches deep to soft sandstone. Wing Variant soils are in similar positions as Bonnerdale soils, have a fine-loamy control section, and have a natric horizon.

Typical pedon of Bonnerdale fine sandy loam, 0 to 5 percent slopes, in a wooded area; SE1/4NE1/4NW1/4 sec. 6, T. 5 S., R. 19 W.

A—0 to 5 inches; brown (10YR 4/3) fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; extremely acid; clear smooth boundary.

BE—5 to 19 inches; yellowish brown (10YR 5/8) fine sandy loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; very friable; many fine and medium roots; few fine iron-manganese concretions; extremely acid; clear smooth boundary.

Bt1—19 to 34 inches; yellowish brown (10YR 5/8) loam; common medium distinct light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; friable; thin patchy clay film on faces of peds; few fine and medium roots; few fine iron-manganese concretions; extremely acid; gradual smooth boundary.

Bt2—34 to 45 inches; mottled strong brown (7.5YR 5/6) and light brownish gray (10YR 6/2) fine sandy loam; moderate medium subangular blocky structure; firm, compact and brittle in about 35 percent of mass; thin patchy clay film on faces of peds; few fine and medium roots; few fine iron-manganese concretions; about 2 percent, by volume, sandstone gravel; extremely acid; gradual smooth boundary.

Bt3—45 to 54 inches; mottled strong brown (7.5YR 5/8) and light brownish gray (10YR 6/2) loam; moderate medium subangular blocky structure; firm, compact and brittle in about 35 percent of the mass; thin patchy clay film on faces of peds; few iron-manganese concretions; few fine and medium roots; about 2 percent, by volume, sandstone gravel; extremely acid; clear smooth boundary.

2Cg—54 to 59 inches; gray (10YR 6/1) clay loam; massive; firm; few fine and medium roots; few fine iron-manganese concretions; about 5 percent, by volume, shale and sandstone fragments; extremely acid; abrupt irregular boundary.

2Cr—59 to 75 inches; very dark gray and brown, weakly cemented, fractured, acid shale containing less than 5 percent gray (10YR 6/1) clay between shale plates; shale bed dip about 35 degrees from the horizontal.

The thickness of the solum ranges from 40 to 60 inches. The depth to tilted shale ranges from 40 to 72 inches or more. Reaction ranges from extremely acid to strongly acid throughout. The content of coarse fragments ranges from 0 to 10 percent in the solum.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. It is fine sandy loam or sandy loam. Mottles in shades of brown range from none to common.

The BE horizon has hue of 10YR, value of 5, and chroma of 4, 6, or 8. It is fine sandy loam or sandy loam. Mottles in shades of brown or gray range from none to common. The Bt horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 4, 6, or 8. This horizon has few to many mottles in shades of gray, or it is mottled in shades of brown and gray. Texture is fine sandy loam,

loam, or sandy loam in the upper part of the Bt horizon and is fine sandy loam, sandy loam, loam, or sandy clay loam in the lower part. Most pedons are brittle in 15 to 35 percent of the mass.

The 2Cg horizon, if present, has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It has none to many brown and red mottles, or it is mottled in shades of gray, brown, and red. This horizon is generally quite variable over short distances. Texture is clay loam, silty clay, clay, or their gravelly or shaly analogs. Coarse fragments of shale and sandstone range from 0 to 30 percent. The 2Cr horizon is gray, brown, and red, soft, weakly cemented, acid shale that has few thin strata of interbedded sandstone. Soil material is less than 5 percent of the volume. Shale beds are fractured, and the bed dip ranges from 25 degrees to near vertical. Hardness of this material on Mohs scale ranges from 1.5 to 3.0.

Bowie Series

The Bowie series consists of deep, moderately well drained, moderately slowly permeable soils that formed in loamy marine sediment. These nearly level to gently sloping soils are on hilltops and side slopes in the Coastal Plain. A perched high water table is at the surface or within a depth of about 36 inches from December through March. The native vegetation is pines and mixed hardwoods. Slopes are 1 to 8 percent.

Bowie soils are associated with Sacul, Savannah, and Smithdale soils. Sacul soils are on a more dissected landscape than Bowie soils, have a clayey control section, and contain less than 5 percent plinthite. Savannah soils are in similar positions on the landscape, have a fragipan, and contain less than 5 percent plinthite. Smithdale soils are on a more dissected landscape, are well drained, and contain less than 5 percent plinthite.

Typical pedon of Bowie fine sandy loam, 1 to 3 percent slopes, in a pasture area; NW1/4SE1/4SW1/4 sec. 7, T. 6 S., R. 16 W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) fine sandy loam; moderate medium granular structure; friable; many fine and medium roots; few worm casts; strongly acid; clear smooth boundary.

E—6 to 17 inches; light yellowish brown (10YR 6/4) fine sandy loam; moderate medium granular structure; friable; many fine and medium roots; strongly acid; clear smooth boundary.

Bt1—17 to 32 inches; yellowish brown (10YR 5/6) sandy clay loam; moderate medium subangular blocky structure; firm; common thick clay film on faces of peds; few fine and medium roots; few fine pores; very strongly acid; gradual smooth boundary.

Bt2—32 to 42 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium distinct light brownish gray (10YR 6/2) and common fine distinct pale brown mottles; moderate medium subangular blocky structure; firm; common thick clay film on faces of peds; few fine and medium roots; few fine pores; few iron-manganese concretions; about 1 percent, by volume, plinthite; very strongly acid; gradual smooth boundary.

Bt3—42 to 52 inches; yellowish brown (10YR 5/6) sandy clay loam; common coarse distinct gray (10YR 6/1) mottles; moderate medium subangular blocky structure; firm, compact and brittle in about 25 percent of mass; common thick clay film on faces of peds; few fine roots; few fine pores; few iron-manganese concretions; about 20 percent, by volume, plinthite; very strongly acid; gradual smooth boundary.

Bt4—52 to 72 inches; yellowish brown (10YR 5/6) sandy clay loam; many coarse distinct gray (10YR 6/1) mottles; moderate medium subangular blocky structure; firm, compact and brittle in about 25 percent of mass; common thick clay film on faces of peds; few fine roots; few fine pores; few iron-manganese concretions; about 10 percent, by volume, plinthite; very strongly acid.

The thickness of the solum ranges from 60 to 80 inches or more. The depth to horizons that contain more than 5 percent plinthite is 25 to 60 inches. Reaction ranges from strongly acid to slightly acid in the A and E horizons and is very strongly acid or strongly acid in the B horizon.

The Ap or A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3.

The E horizon has hue of 10YR, value of 5, and chroma of 2 or 3; or hue of 10YR, value of 6, and chroma of 2 to 4.

The Bt horizon has hue of 10YR, value of 5, and chroma of 4, 6, or 8; or hue of 10YR, value of 6, and chroma of 6 or 8; or hue of 7.5YR, value of 5, and chroma of 6 or 8; or hue of 7.5YR, value of 6, and chroma of 8. In most pedons, the upper part of the Bt horizon has few to common mottles in shades of red. The Bt horizon also has mottles and streaks of gray, light gray, light brownish gray, or grayish brown at a depth of more than 30 inches. Texture is fine sandy loam, clay loam, or sandy clay loam.

Cahaba Series

The Cahaba series consists of deep, well drained, moderately permeable soils that formed in loamy and sandy alluvium. These nearly level to gently sloping soils are on stream terraces in the Coastal Plain. In most areas of these soils, flooding may occur during periods of abnormally heavy rainfall. The native vegetation is pines and mixed hardwoods. Slopes are 1 to 6 percent.

Cahaba soils are associated with Gurdon and Stough soils. Gurdon soils are in slightly lower positions on the

landscape than Cahaba soils, have a coarse-silty control section, and are somewhat poorly drained. Stough soils are in slightly lower positions on the landscape, have a coarse-loamy control section, and are somewhat poorly drained.

Typical pedon of Cahaba fine sandy loam, 1 to 3 percent slopes, in a pine plantation; SW1/4SE1/4SW1/4 sec. 33, T. 10 S., R. 18 W.

A—0 to 5 inches; brown (10YR 4/3) fine sandy loam; few organic stains; moderate medium granular structure; very friable; many medium and fine roots; less than 1 percent, by volume, gravel; strongly acid; clear smooth boundary.

E—5 to 9 inches; yellowish brown (10YR 5/4) fine sandy loam; moderate medium granular and weak subangular blocky structure; very friable; many medium and fine roots; few fine pores; less than 1 percent, by volume, gravel; strongly acid; clear smooth boundary.

Bt1—9 to 29 inches; yellowish red (5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; thick patchy clay film on faces of peds; few fine roots; few fine pores; less than 1 percent, by volume, gravel; strongly acid; gradual smooth boundary.

Bt2—29 to 41 inches; yellowish red (5YR 5/6) sandy clay loam; moderate medium subangular blocky structure; friable; thick patchy clay film on faces of peds; few fine roots; few fine pores; about 1 percent, by volume, gravel; strongly acid; gradual wavy boundary.

C—41 to 72 inches; yellowish brown (10YR 5/8) sandy loam; massive; very friable; few very thin striations; about 1 percent, by volume, gravel that increases with depth; very strongly acid.

The thickness of the solum ranges from 36 to 60 inches. Reaction ranges from medium acid to very strongly acid throughout.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4. An A horizon that has value of 3 is less than 6 inches thick.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 2 to 4; or hue of 7.5YR, value of 5, and chroma of 6 or 8. It is fine sandy loam or loam.

The Bt horizon has hue of 5YR, value of 4, and chroma of 6; or hue of 5YR, value of 4 or 5, and chroma of 6 or 8; or hue of 2.5YR or 10R, value of 4 or 5, and chroma of 6 or 8. Texture is sandy clay loam, loam, or clay loam. The BC horizon, if present, is strong brown, yellowish red, or red. Texture is sandy loam or fine sandy loam.

The C horizon ranges in color from yellowish brown to red. It is commonly interbedded or stratified with textures of sand, loamy sand, sandy loam, and fine sandy loam. This horizon can have mottles of yellow, brown, and gray.

Carnasaw Series

The Carnasaw series consists of deep, well drained, slowly permeable soils that formed in residuum of shale that has lenses of sandstone. These gently sloping to steep soils are on side slopes and in the valleys of the Ouachita Mountains. The native vegetation is pines and mixed hardwoods. Slopes are 3 to 40 percent.

Carnasaw soils are associated with Bigfork, Bismarck, Bonnerdale, Clebit, Pirum, Sherless, Sherwood, Yanush, and Zafra soils. Bismarck, Sherless, and Zafra soils are in similar positions on the landscape as Carnasaw soils. In addition, Bismarck soils have a loamy-skeletal control section and are 10 to 20 inches deep to soft shale bedrock. Sherless soils have a fine-loamy control section and are less than 40 inches deep to soft sandstone bedrock. Zafra soils have a loamy-skeletal control section and are less than 60 inches deep to hard sandstone bedrock. Bigfork, Clebit, Pirum, Sherwood, and Yanush soils are in higher positions on the landscape. In addition, Bigfork soils have a loamy-skeletal control section and are less than 50 inches deep to chert and novaculite bedrock. Clebit soils have a loamy-skeletal control section and are less than 20 inches deep to hard sandstone bedrock. Pirum soils have a fine-loamy control section and are 22 to 50 inches deep to sandstone bedrock. Sherwood soils have a fine-loamy control section and are less than 60 inches deep to hard sandstone bedrock. Yanush soils have a loamy-skeletal control section and are underlain by chert and novaculite bedrock. Bonnerdale soils are in the valleys and on upland flats, have a coarse-loamy control section, and are somewhat poorly drained.

Typical pedon of Carnasaw gravelly silt loam, in a wooded area of Carnasaw-Bismarck-Zafra complex, 8 to 20 percent slopes; NW1/4NE1/4NE1/4 sec. 14, T. 3 S., R. 18 W.

A—0 to 4 inches; dark brown (10YR 4/3) gravelly silt loam; moderate medium granular structure; friable; many fine and medium roots; 15 percent, by volume, sandstone and shale fragments less than 3 inches across; strongly acid; clear smooth boundary.

Bt1—4 to 15 inches; yellowish red (5YR 5/6) silty clay; moderate medium subangular blocky structure; firm; few fine and medium roots; thick patchy clay film on faces of peds; 10 percent, by volume, shale fragments less than 1 inch across; very strongly acid; gradual smooth boundary.

Bt2—15 to 30 inches; red (2.5YR 4/6) silty clay; moderate medium subangular blocky structure; firm; few fine and medium roots; thick patchy clay film on faces of peds; 10 percent, by volume, shale fragments less than 1 inch across; very strongly acid; gradual wavy boundary.

Bt3—30 to 51 inches; red (2.5YR 4/6) silty clay; moderate medium subangular blocky structure; firm;

few fine and medium roots; thick patchy clay film on faces of peds; 10 percent, by volume, yellowish brown and light brownish gray partially decomposed shale fragments; very strongly acid; abrupt wavy boundary.

Cr—51 to 53 inches; weakly cemented, tilted and fractured, acid shale that has thin layers of sandstone.

The thickness of the solum and the depth to shale bedrock range from 40 to 60 inches. Reaction ranges from very strongly acid to medium acid in the A and E horizons, and it is very strongly acid or strongly acid in the B and BC horizons.

The A horizon has hue of 10YR, value of 4, and chroma of 2 or 3; or hue of 7.5YR, value of 4, and chroma of 2. Texture is loam, gravelly silt loam, or cherty silt loam. Coarse fragments of sandstone, shale, chert, and quartzite range from 15 to 35 percent, by volume.

The E horizon, if present, has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. Texture and coarse fragment content of the E horizon are similar to those of the A horizon.

The Bt1 horizon has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4, 6, or 8. Some pedons have mottles in shades of brown, yellow, and red. Texture is silty clay loam, clay loam, silty clay, or clay. Coarse fragments of sandstone, shale, chert, and quartzite range from 2 to 15 percent, by volume. The Bt2, Bt3, and Bt4 horizons have hue of 2.5YR or 5YR, value of 4 to 6, and chroma of 6 or 8. Mottles are in shades of brown, red, or yellow. Texture is clay or silty clay. The coarse fragment content of these horizons is similar to that of the Bt1 horizon. The BC horizon, if present, has hue of 2.5YR or 5YR, value of 4 to 6, and chroma of 6 or 8. Mottles are in shades of gray, brown, or red. Texture is clay, silty clay, or their gravelly or shaly analogs. Coarse fragment content ranges from 5 to 35 percent, by volume.

The Cr horizon is brownish, grayish, or olive shale interbedded with thin layers of sandstone. The shale and sandstone are tilted more than 20 degrees from the horizontal.

Ceda Series

The Ceda series consists of deep, well drained, rapidly permeable soils that formed in loamy and gravelly alluvium. These level soils are on flood plains in the Ouachita Mountains. The soils are occasionally flooded for very brief periods from January through July. The native vegetation is mixed hardwoods and pines. Slopes are 0 to 3 percent.

Ceda soils are associated with Kenn, Toine, and Yanush soils. Kenn and Toine soils are in slightly higher positions on the flood plains than Ceda soils. Kenn and Toine soils have a fine-loamy control section and an argillic horizon. Yanush soils are on foot slopes and side slopes. They have an argillic horizon and are moderately permeable.

Typical pedon of Ceda gravelly fine sandy loam, occasionally flooded, in a pasture; NW1/4NW1/4SE1/4 sec. 35, T. 4 S., R. 18 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) gravelly fine sandy loam; moderate medium granular structure; friable; about 15 percent, by volume, waterworn quartz, sandstone, shale, and chert fragments less than 3 inches across and about 2 percent, by volume, waterworn quartz, sandstone, shale, and chert fragments more than 3 inches across; slightly acid; clear wavy boundary.

A—7 to 15 inches; brown (10YR 4/3) very gravelly fine sandy loam; moderate medium granular structure; friable; about 35 percent, by volume, waterworn quartz, sandstone, shale, and chert fragments less than 3 inches across and about 3 percent, by volume, waterworn quartz, sandstone, shale, and chert fragments more than 3 inches across; medium acid; clear wavy boundary.

C1—15 to 50 inches; yellowish brown (10YR 5/6) very gravelly loam; massive; about 55 percent, by volume, waterworn quartz, sandstone, shale, and chert fragments less than 3 inches across and about 3 percent, by volume, waterworn quartz, sandstone, shale, and chert fragments more than 3 inches across; common thin bedding planes; medium acid; gradual wavy boundary.

C2—50 to 72 inches; yellowish brown (10YR 5/4) extremely gravelly loam; massive; about 65 percent, by volume, waterworn quartz, sandstone, shale, and chert fragments less than 3 inches across and about 5 percent, by volume, waterworn quartz sandstone, shale, and chert fragments more than 3 inches across; medium acid.

Reaction is slightly acid or medium acid throughout.

The A or Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3. If moist value is 3, the A horizon is less than 7 inches thick. Texture is gravelly fine sandy loam or very cherty fine sandy loam. Coarse fragment content ranges from 15 to 50 percent, by volume.

The C horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 2, 3, 4, or 6. Texture of the fine-earth fraction is fine sandy loam, loam, clay loam or their very gravelly, very cherty, extremely gravelly, or extremely cherty analogs. Erratic thin strata of coarse fragments that have less than 15 percent fines are common in the lower part of the C horizon. Coarse fragment content ranges from 35 to 85 percent, by volume.

Clebit Series

The Clebit series consists of shallow, well drained, moderately rapidly permeable soils that formed in residuum of weathered sandstone that has lenses of shale. These nearly level to steep soils are on ridgetops and side slopes of the Ouachita Mountains. The native vegetation is mixed pines and hardwoods. Slopes are 3 to 40 percent.

Clebit soils are associated with Carnasaw, Pirum, and Zafra soils. Carnasaw soils are in lower positions on the landscape than Clebit soils, have a clayey control section, and are more than 40 inches deep to shale bedrock. Pirum soils are in similar positions on the landscape, have a fine-loamy control section, and have an argillic horizon. Zafra soils are in similar positions on the landscape, are more than 25 inches deep to hard sandstone bedrock, and have an argillic horizon.

Typical pedon of Clebit stony fine sandy loam, in a wooded area of Zafra-Carnasaw-Clebit complex, 20 to 40 percent slopes; NE1/4SE1/4SE1/4 sec. 11, T. 6 S., R. 20 W.

A—0 to 6 inches; dark grayish brown (10YR 4/2) stony fine sandy loam; moderate medium granular structure; very friable; 35 percent, by volume, sandstone fragments up to 24 inches across; strongly acid; clear smooth boundary.

Bw—6 to 17 inches; yellowish brown (10YR 5/6) very gravelly fine sandy loam; weak medium subangular blocky structure; friable; 45 percent, by volume, sandstone and shale fragments less than 3 inches across; very strongly acid; abrupt irregular boundary.

R—17 to 19 inches; tilted and fractured, hard sandstone bedrock.

The thickness of the solum and the depth to hard sandstone bedrock range from 10 to 20 inches. The content of coarse fragments ranges from 35 to 60 percent, by volume, throughout. Reaction ranges from slightly acid to strongly acid in the A horizon and from slightly acid to very strongly acid in the B horizon.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3.

The Bw horizon has hue of 10YR, value of 4 or 5, and chroma of 3, 4, or 6; or hue of 7.5YR, value of 4 or 5, and chroma of 4 or 6. Texture is very gravelly fine sandy loam or very gravelly loam.

The R horizon is hard, fractured sandstone that is tilted more than 20 degrees from the horizontal.

Cuthbert Series

The Cuthbert series consists of moderately deep, well drained, moderately slowly permeable soils that formed in weakly consolidated loamy and shaly marine sediment. These steep soils are on upland side slopes in the Coastal Plain. The native vegetation is pines and mixed hardwoods. Slopes are 20 to 40 percent.

Cuthbert soils are associated with Sacul and Smithdale soils. Sacul soils are in similar positions on the landscape as the Cuthbert soils, have sola more than 40 inches thick, and are slowly permeable. Smithdale soils are on a less dissected landscape, have a fine-loamy control section, and are moderately permeable.

Typical pedon of Cuthbert fine sandy loam, 20 to 40 percent slopes, in a forest area; NE1/4SW1/4SE1/4 sec. 35, T. 9 S., R. 18 W.

A—0 to 5 inches; dark grayish brown (10YR 4/2) fine sandy loam; few organic stains; moderate medium granular structure; very friable; many medium and fine roots; about 10 percent, by volume, ironstone and sandstone fragments; medium acid; clear smooth boundary.

E—5 to 9 inches; brown (10YR 5/3) fine sandy loam; moderate medium granular structure; many medium and fine roots; about 10 percent, by volume, ironstone and sandstone fragments; strongly acid; clear smooth boundary.

Bt1—9 to 22 inches; red (2.5YR 4/8) sandy clay; strong medium subangular blocky structure; firm; thick patchy clay film on faces of peds; few fine roots; about 10 percent, by volume, ironstone and sandstone fragments; very strongly acid; gradual smooth boundary.

Bt2—22 to 29 inches; red (2.5YR 4/8) clay; moderate medium subangular blocky structure; firm; thick patchy clay film on faces of peds; few fine roots; about 10 percent, by volume, ironstone and sandstone fragments; very strongly acid; clear smooth boundary.

Cr/C—29 to 72 inches; thinly stratified soft sandstone and shale that have red (2.5YR 4/6), gray (10YR 6/1), and yellowish brown (10YR 5/6) massive fine sandy loam and sandy clay loam between sandstone and shale strata; firm; few fine roots; very strongly acid; weakly cemented sandstone and shale that can be easily cut with a spade.

The thickness of the solum ranges from 20 to 40 inches. Reaction ranges from very strongly acid to slightly acid in the A and E horizons and from extremely acid to strongly acid in the B and C horizons. Fragments that are less than 3 inches across range from 1 to about 15 percent, by volume, in the A and B horizons.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4; or hue of 10YR, value of 3, and chroma of 1; or hue of 7.5YR, value of 3 to 5, and chroma of 2 or 4.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4.

The Bt horizon has hue of 2.5YR or 5YR, value of 3 to 5, and chroma of 4, 6, or 8. Some pedons have few to

common yellowish to brownish mottles. Grayish or brownish horizontally oriented weathered shale fragments or strata are in the lower part of many pedons. Texture is clay, sandy clay, or sandy clay loam. The BC horizon, if present, has reddish, brownish, or yellowish colors. It is stratified or mottled in shades of red, brown, yellow, and gray. The degree of weathering is variable, and some pedons have a BC horizon in which only a few parent material fragments are visible. Texture is sandy clay loam, fine sandy loam, or clay loam. Weathered sandstone and shaly material are in some pedons.

The Cr/C horizon is stratified, weakly consolidated sandy clay loam, fine sandy loam, clay loam, weakly cemented sandstone, and shaly material. The loamy material and the sandstone are reddish, yellowish, or brownish, and the shaly material mainly is grayish shaly clay or very shaly clay. The content of sandstone or shaly material is variable and is absent in some pedons.

Darden Series

The Darden series consists of deep, excessively drained, rapidly permeable soils that formed in sandy marine sediment. These gently sloping to moderately sloping soils are on hilltops and hillsides in the Coastal Plain. The native vegetation is pines and mixed hardwoods. Slopes are 5 to 12 percent.

Darden soils are associated with McLaurin, Sacul, and Smithdale soils. McLaurin soils are in slightly higher positions on the landscape than Darden soils, have an argillic horizon, and have a coarse-loamy control section. Sacul soils are in similar positions on the landscape, have a clayey control section, and are moderately well drained. Smithdale soils are in similar positions on the landscape, have an argillic horizon, and have a fine-loamy control section.

Typical pedon of Darden loamy fine sand, 5 to 12 percent slopes, in a pasture; NW1/4SE1/4SW1/4 sec. 8, T. 4 S., R. 16 W.

Ap—0 to 7 inches; brown (10YR 5/3) loamy fine sand; weak medium granular structure; very friable; many fine and medium roots; medium acid; clear smooth boundary.

C1—7 to 30 inches; brownish yellow (10YR 6/6) loamy fine sand; single grained; loose, very friable; few fine roots; medium acid; gradual smooth boundary.

C2—30 to 53 inches; brownish yellow (10YR 6/6) loamy sand; single grained; loose, very friable; medium acid; gradual wavy boundary.

C3—53 to 82 inches; light yellowish brown (10YR 6/4) loamy sand; few pockets of uncoated sand grains; single grained; loose, very friable; slightly acid.

The thickness of the sandy horizons is more than 80 inches. Reaction ranges from very strongly acid to slightly acid in the A horizon and in the upper part of the C horizon and from very strongly acid to neutral in the lower part of the C horizon. The soil is dry in some part of the moisture control section for 75 to 90 cumulative days in most years. The content of small rounded pebbles ranges from none to few.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 2, 3, 4, or 6; or hue of 7.5YR, value of 4 to 6, and chroma of 2, 4, or 6. Dark brown mottles range from none to few.

The C horizon has hue of 10YR, value of 4 to 7, and chroma of 3, 4, 6, or 8; or hue of 10YR, value of 4 to 7, and chroma of 4 or 6; or hue of 10YR, value of 5 to 7, and chroma of 8. The texture is loamy fine sand or loamy sand. Some pedons have thin strata of fine sand or sand. Mottles in shades of brown or yellow range from none to few. Pockets of clean sand that has chroma of 1 or 2 are at a depth of more than 40 inches in some pedons.

Demopolis Series

The Demopolis series consists of shallow, well drained, moderately slowly permeable soils that formed in residuum of chalk. These gently sloping to moderately sloping soils are on severely eroded ridgetops and side slopes in the Blackland Prairie. The native vegetation is prairie grasses that are intermingled with bois d'arc and eastern redcedar. Slopes are 3 to 12 percent.

Demopolis soils are associated with Oktibbeha and Sumter soils. Oktibbeha soils are in slightly higher positions on the landscape than Demopolis soils, have a very-fine control section, and are more than 20 inches deep to chalk bedrock. Sumter soils are in similar positions on the landscape, have a fine-silty control section, and are more than 20 inches deep to chalk bedrock.

Typical pedon of Demopolis very channery silty clay loam, 3 to 12 percent slopes, severely eroded, in an idle area; SE1/4SW1/4SW1/4 sec. 29, T. 7 S., R. 20 W.

Ap—0 to 3 inches; dark grayish brown (2.5Y 4/2) very channery silty clay loam; moderate medium granular structure; friable; slightly sticky; many fine roots; about 45 percent, by volume, soft chalk fragments; few fossils; moderately alkaline; calcareous; clear smooth boundary.

C—3 to 7 inches; olive gray (5Y 5/2) extremely channery silty clay loam; common medium faint pale yellow (5Y 7/3) mottles; weak fine granular structure to massive; friable, slightly sticky; common fine roots; about 75 percent, by volume, soft chalk fragments; few fossils, moderately alkaline; calcareous; abrupt smooth boundary.

Cr—7 to 11 inches; light olive gray, mottled chalk that can be cut with a spade.

The thickness of the solum ranges from 4 to 16 inches. The soils are calcareous throughout. Reaction is mildly alkaline or moderately alkaline throughout.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. Chalk fragment content ranges from 35 to 55 percent, by volume.

The C horizon has hue of 10YR, 2.5Y or 5Y, value of 5 to 7, and chroma of 1 or 2. Mottles in shades of yellow and brown range from few to common. Texture of the fine-earth fraction is loam, silty clay loam, or their very channery or extremely channery analogs. Chalk fragment content ranges from 60 to 95 percent, by volume. The Cr horizon is gray chalk mottled in shades of brown or yellow. Hardness ranges from 1 to 3 on Mohs' scale.

Eutaw Series

The Eutaw series consists of deep, poorly drained, very slowly permeable soils that formed in thick beds of acid clays underlain by marl and chalk. These level to nearly level soils are on upland flats in the Blackland Prairie. A perched high water table is at a depth of about 6 to 18 inches from December through April. The native vegetation is mixed hardwoods and pines. Slopes are 0 to 2 percent.

Eutaw soils are associated with Kipling, Oktibbeha, and Mayhew soils. Kipling soils are in slightly higher positions on the landscape than Eutaw soils, have a fine control section, and are somewhat poorly drained. Oktibbeha soils are in higher positions on the landscape, are moderately well drained, and are 20 to 50 inches deep to marl or chalk. Mayhew soils are in similar positions on the landscape, have a fine control section, and are underlain by acid shale.

Typical pedon of Eutaw silty clay loam, 0 to 2 percent slopes, in a wooded area; NE1/4SE1/4SE1/4 sec. 16, T. 9 S., R. 20 W.

A—0 to 5 inches; dark gray (10YR 4/1) silty clay loam; moderate medium granular structure; firm; many fine and medium roots; few organic stains; few iron-manganese concretions; medium acid; clear smooth boundary.

Btg—5 to 28 inches; gray (10YR 6/1) clay; common medium distinct brownish yellow (10YR 6/8) and few fine prominent yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; very firm, sticky and plastic; thick patchy clay film on faces of peds; few nonintersecting slickensides; common fine and medium roots; few fine pores; few iron-manganese concretions; strongly acid; clear smooth boundary.

Cg1—28 to 51 inches; gray (10YR 6/1) clay; common medium distinct yellowish brown (10YR 5/8) and (10YR 5/4) and few fine prominent yellowish red (5YR 4/6) mottles; many intersecting slickensides that form wedge-shaped aggregates parting to blocky structure; very firm, plastic and sticky; few mica flakes; few fine roots; common iron-manganese concretions; few fine pores; very strongly acid; clear wavy boundary.

Cg2—51 to 61 inches; gray (5Y 6/1) clay; few fine prominent yellowish red mottles; many intersecting slickensides that form wedge-shaped aggregates parting to blocky structure; very firm, sticky and plastic; few mica flakes; few fine roots; common iron-manganese concretions; few fine pores; very strongly acid; gradual smooth boundary.

Cg3—61 to 72 inches; gray (5Y 5/1) clay; common medium distinct light olive brown (2.5Y 5/4) mottles; many intersecting slickensides that form wedge-shaped aggregates parting to blocky structure; very firm, sticky and plastic; few mica flakes; few fine roots; common iron-manganese concretions; few fine pores; very strongly acid.

The thickness of the solum and depth to the Cg horizon range from 16 to 30 inches. Reaction ranges from medium acid to extremely acid in the A, BE, and Btg, horizons and in the upper part of the Cg horizon. It ranges from very strongly acid to mildly alkaline in the lower part of the C horizon.

The A horizon has hue of 10YR, value of 3 to 6, and chroma of 1.

The BE horizon, if present, has hue of 10YR, value of 4 to 6, and chroma of 1. Mottles are in shades of gray and brown. Texture is silty clay or clay. The Btg horizon has hue of 10YR or 5Y, value of 4 to 6, and chroma of 1. Mottles are in shades of brown, yellow, or red.

The Cg1 horizon has hue of 10YR or 5Y, value of 5 to 7, and chroma of 1. The Cg2 and Cg3 horizons have colors that are similar to those of the Cg1 horizon; or they have brownish yellow, yellowish brown, or light olive brown matrix colors that have few to many grayish mottles; or they are mottled in shades of gray, brown, and yellow.

Foley Series

The Foley series consists of deep, poorly drained, very slowly permeable soils that formed in fluvial sediment. This sediment has a high content of sodium. These level to nearly level soils are on stream terraces and upland flats in the Coastal Plain. A perched high water table is at the surface or within a depth of about 12 inches from December through April. The native vegetation is mixed hardwoods and pines. Slopes are 0 to 2 percent.

Foley soils are associated with Amy, Gurdon, and Stough soils. These associated soils do not have a natric horizon. Amy soils are in slightly lower positions on the landscape than the Foley soils and have a lower base saturation. Gurdon and Stough soils are in similar positions on the landscape as Foley soils. Gurdon soils have a coarse-silty control section. Stough soils have a coarse-loamy control section.

Typical pedon of Foley silt loam, 0 to 2 percent slopes; SW1/4SE1/4NE1/4 sec. 10, T. 6 S., R. 18 W.

A—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam; common medium faint grayish brown (10YR 5/2) mottles; weak fine granular structure; friable; common fine and medium roots; common small iron-manganese concretions; strongly acid; clear smooth boundary.

Eg—5 to 13 inches; grayish brown (10YR 5/2) silt loam; few medium distinct brown (10YR 5/3) mottles; few organic stains; moderate medium subangular blocky structure; friable; common fine and medium roots; common small iron-manganese concretions; strongly acid; clear wavy boundary.

BEg—13 to 23 inches; light brownish gray (10YR 6/2) silt loam; few medium faint grayish brown (10YR 5/2) and common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; few fine roots; silt interfingers 4 millimeters thick throughout; common small iron-manganese concretions; neutral; clear wavy boundary.

Btg1—23 to 32 inches; light brownish gray (10YR 6/2) silty clay loam; few medium distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate fine subangular blocky structure; firm; few fine roots; silt interfingers 2 millimeters thick throughout; common small iron-manganese concretions; neutral; gradual wavy boundary.

Btg2—32 to 45 inches; light brownish gray (10YR 6/2) silty clay loam; common medium distinct brown (10YR 5/3) and yellowish brown (10YR 5/4) mottles; moderate medium prismatic structure parting to moderate fine subangular blocky structure; firm; few fine roots; common small iron-manganese concretions; mildly alkaline; gradual wavy boundary.

BC—45 to 72 inches; mottled pale brown (10YR 6/3), gray (10YR 5/1), and yellowish brown (10YR 5/4) silt loam; moderate medium subangular blocky structure; friable; few fine roots; common small iron-manganese concretions; mildly alkaline.

The thickness of the solum ranges from 40 to 72 inches or more. Exchangeable sodium is more than 15 percent at a depth of 7 to 16 inches in the upper part of the B horizon. Reaction is strongly acid or medium acid in the A and E horizons. It ranges from strongly acid to neutral in the BE horizon and in the upper part of the Bt horizon, from neutral to moderately alkaline in the lower part of the Bt horizon, and from neutral to strongly alkaline in the BC and C horizons.

The A horizon has hue of 10YR, value of 3, and chroma of 3; or hue of 10YR, value of 4, and chroma of 2. In cultivated areas, the Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2; or hue of 10YR, value of 5, and chroma of 3.

The Eg horizon has hue of 10YR, value of 6, and chroma of 1; or hue of 10YR, value of 5 or 6, and chroma of 2. Texture is silt loam or loam.

The BEg and Btg horizons have hue of 10YR, value of 4 to 6, and chroma of 1 or 2. Mottles are in shades of gray or brown. Texture is silt loam or silty clay loam. Interfingers or tongues of silt, 2 to 5 millimeters thick, are common on vertical ped faces. The BC horizon has hue of 10YR, value of 4 to 6, and chroma of 1 to 3. Texture is silt loam or silty clay loam.

The C horizon, if present, has colors that are similar to those in the BC horizon. Texture is silt loam, loam, or fine sandy loam.

Gurdon Series

The Gurdon series consists of deep, somewhat poorly drained, moderately permeable soils that formed in silty alluvium. These level to nearly level soils are on stream terraces in the Coastal Plain. An apparent high water table is at a depth of 1 to 2 feet during the winter and spring. These soils are occasionally to rarely flooded in the winter and spring. The native vegetation is mixed hardwoods and pines. Slopes range from 0 to 3 percent.

Gurdon soils are associated with Adaton, Amy, Foley, Harleston, and Stough soils. Adaton and Amy soils are in slightly lower positions on the landscape than Gurdon soils, have a fine-silty control section, and are poorly drained. Also, Adaton soils have a higher base saturation than Gurdon soils. Foley, Harleston, and Stough soils are in similar positions on the landscape as Gurdon soils. In addition, Foley soils have a natric horizon and a fine-silty control section; Harleston soils are moderately well drained and have a coarse-loamy control section; Stough soils have a coarse-loamy control section, and in the lower part of the subsoil, Stough soils are brittle in 40 to 55 percent of the volume.

Typical pedon of Gurdon silt loam, 1 to 3 percent slopes, in a wooded area; SW1/4SE1/4SE1/4 sec. 20, T. 10 S., R. 18 W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; few fine faint pale brown mottles; few organic stains; moderate medium granular structure; very friable; many fine and medium roots; few iron-manganese concretions; very strongly acid; clear smooth boundary.

BE—4 to 10 inches; yellowish brown (10YR 5/4) silt loam; common fine distinct pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; friable; thin patchy clay film on faces of peds; common fine and medium roots; few fine pores; few iron-manganese concretions; very strongly acid; clear smooth boundary.

Bt1—10 to 21 inches; yellowish brown (10YR 5/6) silt loam; common medium distinct light brownish gray (10YR 6/2) mottles; moderate medium subangular

blocky structure; friable; thick patchy clay film on faces of peds; common fine and medium roots; few fine pores; common iron-manganese concretions; extremely acid; gradual smooth boundary.

Bt2—21 to 30 inches; yellowish brown (10YR 5/6) silt loam; common coarse distinct gray (10YR 6/1) mottles; moderate medium subangular blocky structure; firm, compact and brittle in 25 percent of the mass; thick patchy clay film on faces of peds; few fine roots; common fine pores; common iron-manganese concretions; about 1 percent, by volume, plinthite; extremely acid; gradual smooth boundary.

Bt3—30 to 50 inches; mottled yellowish brown (10YR 5/6) and gray (10YR 6/1) silt loam; moderate medium subangular blocky structure; firm, compact and brittle in about 25 percent of the mass; thick patchy clay film on faces of peds; common fine roots; few fine pores; common iron-manganese concretions; about 1 percent, by volume, plinthite; very strongly acid; gradual smooth boundary.

Bt4—50 to 64 inches; yellowish brown (10YR 5/6) silt loam; common coarse distinct gray (10YR 6/1) mottles; moderate medium subangular blocky structure; firm; thick patchy clay film on faces of peds; few fine roots; few fine pores; common iron-manganese concretions; very strongly acid; gradual smooth boundary.

Bt5—64 to 72 inches; yellowish brown (10YR 5/6) silty clay loam; common coarse distinct gray (10YR 6/1) mottles; moderate medium subangular blocky structure; firm; thin patchy clay film on faces of peds; few fine roots; few fine pores; common iron-manganese concretions; very strongly acid.

The thickness of the solum ranges from 60 to 80 inches or more. Reaction ranges from medium acid to extremely acid throughout.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. If present, the E horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4.

The BE horizon has hue of 10YR, value of 5, and chroma of 3, 4, or 6. Texture is silt loam, very fine sandy loam, or loam. Mottles that have chroma of 3 or less range from none to many. The Bt1 and Bt2 horizons have hue of 10YR, value of 5 or 6, and chroma of 4, 6, or 8. Mottles that have chroma of 2 or less range from few to many. Texture is silt loam, very fine sandy loam, or loam. The Bt3, Bt4, and Bt5 horizons have hue of 10YR, value of 5 or 6, and chroma of 4 or 6. These horizons have common to many mottles that have chroma of 2 or less, or they are mottled in shades of brown and gray. Texture is silt loam, loam, or silty clay loam. Some of the subhorizons in the Bt horizon are compact and brittle in 10 to 40 percent of the volume. Plinthite content ranges from 0 to 5 percent.

The BC and C horizons, if present, have colors that are similar to those in the lower part of the Bt horizon. Texture is silty clay loam or silty clay.

Guyton Series

The Guyton series consists of deep, poorly and very poorly drained, slowly permeable soils that formed in alluvial sediment. These level to depressional soils are on flood plains and low stream terraces in the Coastal Plain. A perched high water table is at the surface or within a depth of 18 inches from December through May. Most areas of Guyton soils that are on stream terraces are occasionally flooded during the winter and the spring. Most of the year, Guyton soils that are on the flood plains and in depressions are ponded throughout. The native vegetation is mixed hardwoods and a few scattered pines. Slopes are 0 to 1 percent.

Guyton soils are associated with Ouachita and Sardis soils. Ouachita soils are on natural levees. They do not have an argillic horizon and are well drained. Sardis soils are in slightly higher positions on the landscape than Guyton soils. They do not have an argillic horizon and are moderately permeable.

Typical pedon of Guyton silt loam, occasionally flooded, in a forest area; SW1/4SE1/4NW1/4 sec. 5, T. 8 S., R. 18 W.

A—0 to 5 inches; grayish brown (10YR 5/2) silt loam; few dark organic stains; moderate medium granular structure; friable; many medium and fine roots; few iron-manganese concretions; very strongly acid; clear smooth boundary.

Eg1—5 to 17 inches; gray (10YR 6/1) silt loam; few medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; many medium and fine roots; few iron-manganese concretions; very strongly acid; clear smooth boundary.

Eg2—17 to 23 inches; gray (10YR 6/1) silt loam; few medium distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable; few medium and fine roots; few iron-manganese concretions; very strongly acid; abrupt irregular boundary.

Btg/Eg—23 to 44 inches; gray (10YR 5/1) loam; common medium distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; thick patchy clay film on faces of peds; tongues of gray (10YR 6/1) silt loam 2 to 5 inches wide in about 30 percent of horizon; few fine roots; few iron-manganese concretions; very strongly acid; gradual smooth boundary.

Btg1—44 to 63 inches; gray (10YR 5/1) silt loam; common coarse distinct yellowish brown (10YR 5/6) and few fine prominent yellowish red mottles; moderate medium subangular blocky structure; firm;

thick patchy clay film on faces of peds; tongues of gray silt loam 1/2 to 1 inch wide in about 10 percent of horizon; few pockets of fine sandy loam; few fine roots; few iron-manganese concretions; very strongly acid; gradual wavy boundary.

Btg2—63 to 72 inches; gray (10YR 5/1) silt loam; common coarse distinct yellowish brown (10YR 5/6) and common fine prominent yellowish red (5YR 5/6) mottles; moderate medium subangular blocky structure; firm; thick patchy clay film on faces of peds; few fine roots; few iron-manganese concretions; very strongly acid.

The thickness of the solum ranges from 50 to about 80 inches. Reaction ranges from extremely acid to medium acid in the A, E, and B horizons and from strongly acid to moderately alkaline in the C horizon. Exchangeable sodium ranges from about 10 to 40 percent in the lower part of the solum.

The A or Ap horizons have hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 or 3.

The Eg horizon has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 1 or 2. Mottles in shades of brown range from few to many. Texture is silt loam, loam, or very fine sandy loam. The lower boundary of the E horizon is clear irregular or abrupt irregular. From this part of the horizon, tongues extend into the B horizon.

The Btg horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. Few to many mottles are in shades of brown and gray. Texture is silt loam, silty clay loam, or clay loam.

The BCg and Cg horizons have the same color range as that of the Btg horizon. Texture is silt loam, silty clay loam, clay loam, or sandy clay loam.

Harleston Series

The Harleston series consists of deep, moderately well drained, moderately permeable soils that formed in marine or fluvial sediment. These nearly level soils are on stream terraces and upland flats in the Coastal Plain. An apparent high water table is at a depth of 24 to 36 inches from November through March. Flooding can occur during periods of abnormally heavy rainfall. The native vegetation is pines and mixed hardwoods. Slopes are 1 to 3 percent.

Harleston soils are associated with Gurdon, Smithton, and Stough soils. Gurdon soils are in similar positions on the landscape as Harleston soils, have a coarse-silty control section, and are somewhat poorly drained. Smithton soils are in slightly lower positions, are moderately slowly permeable, and are poorly drained. Stough soils are in similar positions on the landscape but are somewhat poorly drained. These soils are brittle and compact in about 40 to 55 percent of the volume of the B horizon.

Typical pedon of Harleston fine sandy loam 1 to 3 percent slopes, in a wooded area; NE1/4SE1/4NW1/4 sec. 30, T. 3 S., R. 16 W.

A—0 to 4 inches; dark brown (10YR 4/3) fine sandy loam; weak medium granular structure, very friable, many fine and medium roots; strongly acid; abrupt smooth boundary.

E—4 to 9 inches; yellowish brown (10YR 5/4) fine sandy loam; weak medium granular structure; very friable; few fine and medium roots; strongly acid; clear smooth boundary.

Bt1—9 to 24 inches; light yellowish brown (10YR 6/4) sandy loam; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; common fine and medium roots; strongly acid; clear wavy boundary.

Bt2—24 to 36 inches; light yellowish brown (10YR 6/4) sandy loam, few fine distinct yellowish brown (10YR 5/6) and light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; common fine and medium roots; sand grains coated and bridged with clay; very strongly acid; gradual wavy boundary.

Bt3—36 to 48 inches; yellowish brown (10YR 5/8) sandy clay loam, common medium distinct light brownish gray (10YR 6/2) and few fine distinct light yellowish brown (10YR 6/4) mottles; moderate medium subangular blocky structure; firm and slightly brittle; few fine roots; sand grains coated and bridged with clay; thin patchy clay film on faces of peds; 2 percent, by volume, plinthite; very strongly acid; gradual wavy boundary.

Bt4—48 to 72 inches; coarsely mottled yellowish brown (10YR 5/8), light brownish gray (10YR 6/2), and light yellowish brown (10YR 6/4) sandy clay loam; moderate medium subangular blocky structure; firm and slightly brittle; few fine roots; sand grains coated and bridged with clay; thin patchy clay film on faces of peds; 2 percent, by volume, plinthite; extremely acid.

The thickness of the solum is more than 60 inches. Reaction ranges from strongly acid to extremely acid. The content of gravel ranges from 0 to 10 percent in all horizons.

The A or Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 1 to 3.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. Texture is loam, sandy loam, or fine sandy loam.

The Bt1 and Bt2 horizons have hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4, 6, or 8. Mottles that have chroma of 2 or less range from few to many in the Bt2 horizon. The Bt3 and Bt4 horizons have colors that are similar to those of the Bt1 and Bt2 horizons, or they are mottled in shades of gray, brown, and red. Texture of

these horizons is sandy loam or loam in the upper part. In the lower part, it is sandy loam, loam, or sandy clay loam. Plinthite content ranges from 1 to 5 percent in the Bt3 and Bt4 horizons.

Houston Series

The Houston series consists of deep, moderately well drained, very slowly permeable soils that formed in residuum of weathered chalk and marl. These nearly level to gently sloping soils are on uplands in the Blackland Prairie. An apparent high water table is within a depth of 48 inches of the surface from January through March. The native vegetation is prairie grasses, bois d'arc, and eastern redcedar. Slopes are 1 to 8 percent.

Houston soils are associated with Kipling and Sumter soils. Kipling soils are in slightly lower positions on the landscape than Houston soils. They have an argillic horizon and a fine control section. Sumter soils are on a more dissected landscape, have carbonatic mineralogy, and have a fine-silty control section. These soils do not have intersecting slickensides.

Typical pedon of Houston clay, 3 to 8 percent slopes, eroded, in a pasture; NW1/4SE1/4SE1/4 sec. 19, T. 8 S., R. 21 W.

Ap—0 to 6 inches; very dark gray (5Y 3/1) clay; moderate medium granular structure; firm, sticky and plastic; common fine and medium roots; mildly alkaline; clear smooth boundary.

A—6 to 20 inches; dark olive gray (5Y 3/2) clay; moderate medium subangular blocky structure; firm, sticky and plastic; common fine and medium roots; mildly alkaline; gradual wavy boundary.

AC—20 to 31 inches; olive (5Y 4/3) clay; common wedges of very dark gray (5Y 3/1) clay from A horizon; moderate medium subangular blocky structure; very firm, sticky and plastic; many intersecting slickensides; common fine roots; few medium calcium-carbonate concretions; mildly alkaline; calcareous; gradual wavy boundary.

C1—31 to 61 inches; yellowish brown (10YR 5/6) clay; common fine distinct gray mottles; massive; very firm, sticky and plastic; many intersecting slickensides; common fine roots; few medium calcium-carbonate concretions; mildly alkaline; calcareous; gradual smooth boundary.

C2—61 to 72 inches; light olive brown (2.5Y 5/6) clay; common medium distinct gray (5Y 6/1) mottles; massive; very firm, sticky and plastic; few intersecting slickensides; few fine roots; few medium calcium-carbonate concretions; mildly alkaline; calcareous.

The depth to chalk ranges from 48 to 80 inches or more. Reaction ranges from slightly acid to mildly alkaline in the A and AC horizons and from neutral to moderately alkaline in the C horizon. Few to many calcium carbonate concretions are in the AC and C horizons.

The A horizon has hue of 10YR, value of 2, and chroma of 1; or hue of 10YR, value of 3, and chroma of 1 or 2; or hue of 2.5Y, value of 3, and chroma of 2; or hue of 5Y, value of 2.5 or 3, and chroma of 1 or 2. The AC horizon has hue of 2.5Y, value of 4 or 5, and chroma of 2; or hue of 5Y, value of 4 or 5, and chroma of 2 or 3; or hue of 10YR, value of 4 or 5, and chroma of 2 or 3.

The C horizon has hue of 2.5Y, value of 4, and chroma of 4; or hue of 2.5Y, value of 5, and chroma of 4 or 6; or hue of 5Y, value of 4, and chroma of 4; or hue of 10YR, value of 5, and chroma of 4 or 6. Mottles in shades of brown, yellow, and gray range from few to common. The Cr horizon, if present, is soft chalk bedrock in shades of gray and yellow.

Iuka Series

The Iuka series consists of deep, moderately well drained, moderately permeable soils that formed in alluvial sediment. These level soils are on flood plains in the Coastal Plain. An apparent high water table is at a depth of 12 to 36 inches from December through April. Iuka soils are occasionally flooded in the winter and spring. The native vegetation is hardwoods and a few pines. Slopes are 0 to 1 percent.

Iuka soils are associated with Ochlockonee and Ouachita soils. Ochlockonee soils are in slightly higher positions on the landscape than Iuka soils. They are well drained and have moderately rapid permeability. Ouachita soils are in slightly higher positions on the landscape. They are well drained and have a fine-silty control section.

Typical pedon of Iuka fine sandy loam, occasionally flooded; NE1/4NW1/4SW1/4 sec. 9, T. 9 S., R. 19 W.

A1—0 to 5 inches; dark brown (10YR 4/3) fine sandy loam; weak medium granular structure; friable; very strongly acid; abrupt smooth boundary.

A2—5 to 13 inches; brown (10YR 5/3) fine sandy loam; weak medium granular structure; friable; very strongly acid; gradual wavy boundary.

C1—13 to 29 inches; yellowish brown (10YR 5/4) fine sandy loam; few fine distinct light brownish gray (10YR 6/2) and few fine faint yellowish brown mottles; massive; friable; common black and brown stains and few concretions; very strongly acid; gradual wavy boundary.

C2—29 to 45 inches; light brownish gray (10YR 6/2) fine sandy loam that has few thin strata of yellowish brown (10YR 5/4) loam in lower part; common medium distinct yellowish brown (10YR 5/6) mottles; massive; friable; common black and brown stains and concretions; very strongly acid; gradual wavy boundary.

C3—45 to 72 inches; gray (10YR 6/1) loam; common medium distinct yellowish brown (10YR 5/8) and few fine distinct yellowish brown (10YR 5/6) mottles; massive; friable; common black and brown stains and concretions; very strongly acid.

Reaction is strongly acid or very strongly acid throughout. Thin bedding planes of a contrasting texture are common in most pedons.

The A horizon has hue of 10YR, 7.5YR, value of 4 to 6, and chroma of 3 or 4; or hue of 10YR or 7.5YR, value of 4, and chroma of 2.

The C1 horizon has hue of 10YR, value of 4 to 6, and chroma of 3, 4, or 6; or hue of 7.5YR, value of 4 to 6, and chroma of 4 or 6; or hue of 10YR or 7.5YR, value of 4, and chroma of 2. Mottles that have chroma of 2 or less are within a depth of 20 inches. Texture is sandy loam, fine sandy loam, loam, or silt loam. The C2 and C3 horizons have colors that are the same as those of the C1 horizon; or they do not have a matrix color and are mottled in shades of gray, brown, or red; or they may be dominantly gray and have many mottles of brown, red, and yellow. Texture is sandy loam, fine sandy loam, loam, or silt loam.

Some pedons have thin gravelly or sandy strata, and some pedons have texture of sandy clay loam or clay loam at a depth of more than 40 inches.

Kenn Series

The Kenn series consists of deep, well drained, moderately permeable soils that formed in alluvial sediment. These level soils are on flood plains and low terraces in the Ouachita Mountains. These soils are occasionally flooded in the winter and the spring. The native vegetation is mixed hardwoods and pines. Slopes are 0 to 3 percent.

Kenn soils are associated with Ceda and Toine soils. Ceda soils are on the more narrow and slightly lower flood plains. They have a loamy-skeletal control section and do not have an argillic horizon. Toine soils are in similar positions on the landscape as Kenn soils, have mixed mineralogy, and have less coarse fragments in the lower part of the solum.

Typical pedon of Kenn fine sandy loam, occasionally flooded, in a pasture area; SW1/4NE1/4SE1/4 sec. 31, T. 5 S., R. 18 W.

Ap—0 to 8 inches; brown (10YR 4/3) fine sandy loam; weak medium granular structure; friable; about 5 percent, by volume, subrounded sandstone fragments; strongly acid; clear smooth boundary.

Bt—8 to 28 inches; yellowish red (5YR 5/6) sandy clay loam; moderate medium subangular blocky structure; friable; thin patchy clay film on faces of peds; about 10 percent, by volume, subrounded sandstone fragments; very strongly acid; gradual wavy boundary.

2BC—28 to 41 inches; strong brown (7.5YR 5/6) very gravelly sandy clay loam; weak medium subangular blocky structure; friable; about 35 percent, by volume, subrounded sandstone fragments; very strongly acid; gradual wavy boundary.

2C—41 to 72 inches; brown (7.5YR 4/4) extremely gravelly fine sandy loam; massive; very friable; about 65 percent, by volume, subrounded sandstone fragments; strongly acid.

The thickness of the solum is 40 to 60 inches. Depth to the gravelly 2BC horizon ranges from 20 to 40 inches. Reaction ranges from slightly acid to strongly acid in the A horizon and is very strongly acid or strongly acid in the B, BC, and C horizons.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 to 4; or hue of 7.5YR, value of 3 or 4, and chroma of 2 or 4. Content of coarse fragments of sandstone ranges from 5 to 15 percent, by volume.

The BE horizon, if present, is 3 to 6 inches thick. It has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. Texture is loam or fine sandy loam or their gravelly analogs. Content of coarse fragments ranges from 5 to 25 percent, by volume. The Bt horizon has hue of 5YR, value of 4 or 5, and chroma of 3, 4, or 6; or hue of 7.5YR, value of 4 or 5, and chroma of 4 or 6. Texture is clay loam, sandy clay loam, or their gravelly analogs. Content of coarse fragments of sandstone ranges from 5 to 35 percent, by volume. The 2BC horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3, 4, or 6; or hue of 7.5YR, value of 4 or 5, and chroma of 4 or 6. Texture is very gravelly clay loam or very gravelly sandy clay loam. Content of coarse fragments of sandstone ranges from 35 to 60 percent, by volume.

The 2C horizon has hue of 10YR, value of 4 or 5, and chroma of 3, 4, or 6; or hue of 7.5YR, value of 4 or 5, and chroma of 4 or 6. Texture is extremely gravelly loam, extremely gravelly sandy clay loam, or extremely gravelly fine sandy loam. Content of coarse fragments of sandstone ranges from 60 to 90 percent, by volume.

Kipling Series

The Kipling series consists of deep, somewhat poorly drained, very slowly permeable soils that formed in acid, clayey marine sediment underlain by marl and chalk. These level to gently sloping soils are on uplands in the Blackland Prairie. A perched high water table is at a depth of 18 to 36 inches from January through March. The native vegetation is pines and mixed hardwoods. Slopes are 0 to 5 percent.

Kipling soils are associated with Eutaw, Houston, Oktibbeha, and Trebloc soils. Eutaw soils are in slightly lower positions on the landscape than Kipling soils. They have a very-fine control section and intersecting slickensides, and they are poorly drained. Houston soils are in slightly lower positions on the landscape, have a

very-fine control section, and do not have an argillic horizon. Oktibbeha soils are in higher positions on the landscape, have a very-fine control section, and are moderately well drained. Trebloc soils are in slightly lower positions on the landscape, have a fine-silty control section, and are poorly drained.

Typical pedon of Kipling silt loam, 0 to 2 percent slopes, in a wooded area; NW1/4SW1/4NE1/4 sec. 23, T. 8 S., R. 20 W.

A—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium granular structure; friable; many fine and medium roots; few organic stains; few iron-manganese concretions; very strongly acid; clear smooth boundary.

E—5 to 12 inches; brown (10YR 5/3) silty clay loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; firm; many fine and few medium roots; few iron-manganese concretions; very strongly acid; clear smooth boundary.

Bt1—12 to 24 inches; mottled yellowish brown (10YR 5/6), light brownish gray (10YR 6/2), and yellowish red (5YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm; thick patchy clay film on faces of peds; many fine and few medium roots; few iron-manganese concretions, very strongly acid; clear smooth boundary.

Bt2—24 to 33 inches; mottled light brownish gray (10YR 6/2), yellowish brown (10YR 5/6), and yellowish red (5YR 4/8) clay; strong medium subangular blocky structure; very firm, sticky and plastic; thick patchy clay film on faces of peds; few fine roots; few iron-manganese concretions; many nonintersecting slickensides; very strongly acid; gradual smooth boundary.

Bt3—33 to 45 inches; mottled light brownish gray (10YR 6/2), olive yellow (2.5Y 6/6), yellowish brown (10YR 5/6), and yellowish red (5YR 5/6) clay; strong medium subangular blocky structure; very firm, sticky and plastic; thick patchy clay film on faces of peds; many nonintersecting slickensides; few fine roots; very strongly acid; gradual wavy boundary.

BC—45 to 54 inches; mottled light brownish gray (10YR 6/2), olive yellow (2.5Y 6/6), and yellowish red (5YR 5/6) clay; moderate medium subangular blocky structure; very firm, sticky and plastic; thick patchy clay film on faces of peds; many intersecting slickensides; few fine roots; very strongly acid; abrupt wavy boundary.

C1—54 to 63 inches; mottled yellowish brown (10YR 5/6), grayish brown (10YR 5/2), and olive yellow (2.5Y 6/8) clay; massive; very firm; common intersecting slickensides; few fine roots; common chalk fragments; slightly acid; gradual smooth boundary.

C2—63 to 72 inches; mottled yellowish brown (10YR 5/6), grayish brown (10YR 5/2), and olive yellow (2.5Y 6/8) clay; massive; very firm; common intersecting slickensides; few fine roots; common chalk fragments; neutral.

The thickness of the solum ranges from 25 to 55 inches. Marly clay is in an irregular pattern under the acid clay at a depth of 36 to 80 inches or more. Reaction ranges from medium acid to extremely acid in the A and Bt horizons and from very strongly acid to moderately alkaline in the BC and C horizons.

The A or Ap horizon has hue of 10YR, value of 3, and chroma of 3; or hue of 10YR, value of 4, and chroma of 1 or 2; or hue of 10YR, value of 5, and chroma of 3; or hue of 5Y, value of 4, and chroma of 1; or hue of 2.5Y, value of 4, and chroma of 2. Texture is silt loam or silty clay loam.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 2 or 3. Texture is loam or silty clay loam.

The Bt horizon has hue of 10YR, value of 5, and chroma of 4, 6, or 8; or hue of 7.5YR, value of 5, and chroma of 6; or the horizon is mottled in shades of yellow, brown, gray, and red. In some pedons, the lower part of the Bt horizon has hue of 10YR or 5Y, value of 5 or 6, and chroma of 1; or hue of 10YR or 5Y, value of 7, and chroma of 1 or 2. This horizon has mottles in shades of brown and yellow. Texture of the Bt horizon is silty clay loam, clay loam, silty clay, or clay.

The BC and C horizons have hue of 10YR or 5Y, value of 5 or 6, and chroma of 1; or hue of 10YR or 2.5Y, value of 6, and chroma of 2. These horizons have mottles in shades of brown and yellow, or they are mottled in shades of yellow, red, brown, and gray. Texture is silty clay or clay. Manganese concretions in the C horizon range from few to many. Lime concretions range from none to many.

Kirkville Series

The Kirkville series consists of deep, moderately well drained, moderately permeably soils that formed in loamy alluvium. These level soils are on flood plains in the Coastal Plain. An apparent high water table is at a depth of 18 to 30 inches from January through April. Kirkville soils are occasionally flooded in the winter and spring. The native vegetation is hardwoods and pines. Slopes are 0 to 1 percent.

Kirkville soils are associated with Ozan and Sardis soils. Ozan soils are on the lower flood plains. They have an argillic horizon and are poorly drained. Sardis soils are in similar positions on the landscape as Kirkville soils. They have a fine-silty control section and are somewhat poorly drained.

Typical pedon of Kirkville fine sandy loam, occasionally flooded, in a wooded area; SW1/4NW1/4SW1/4 sec. 33, T. 6 S., R. 17 W.

A—0 to 7 inches; dark grayish brown (10YR 4/2) fine sandy loam; moderate medium granular structure; very friable; common fine and medium roots; strongly acid; clear smooth boundary.
Bw1—7 to 16 inches; yellowish brown (10YR 5/4) fine sandy loam; few fine faint pale brown mottles; weak medium subangular blocky structure; very friable; few fine roots; few fine pores; strongly acid; gradual smooth boundary.
Bw2—16 to 33 inches; yellowish brown (10YR 5/4) fine sandy loam; common medium distinct light brownish gray (10YR 6/2) and common fine distinct strong brown mottles; weak medium subangular blocky structure; friable; few fine roots; few fine pores; very strongly acid; gradual smooth boundary.
Bg1—33 to 48 inches; light brownish gray (10YR 6/2) fine sandy loam; common medium distinct yellowish brown (10YR 5/8) and common fine distinct dark yellowish brown mottles; weak medium subangular blocky structure; friable; few fine roots; few fine pores; few iron-manganese concretions; very strongly acid; clear wavy boundary.
Bg2—48 to 65 inches; light brownish gray (10YR 6/2) fine sandy loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; few fine roots; few fine pores; few iron-manganese concretions; strongly acid; clear wavy boundary.
Cg—65 to 72 inches; mottled gray (10YR 6/1) and yellowish brown (10YR 5/6) sandy loam; structureless; very friable; few fine roots; few iron-manganese concretions; very strongly acid.

The thickness of the solum ranges from 30 to 60 inches or more. Reaction is strongly acid or very strongly acid throughout.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4; or hue of 2.5Y, value of 4, and chroma of 2; or hue of 7.5YR, value of 5, and chroma of 4.

The Bw1 horizon has hue of 10YR, value of 4 or 5, and chroma of 3, 4, or 6; or hue of 2.5Y, value of 5, and chroma of 4. This horizon has mottles that have chroma of 2 or less in some pedons, or it is mottled in shades of brown and gray. The Bw2 horizon has matrix colors that are similar to those of the Bw1 horizon. The Bw2 horizon has few to many mottles that have chroma of 2 or less, or it is mottled in shades of brown and gray. The Bg horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 or less. This horizon has mottles in shades of brown, or it is mottled in shades of brown or gray. The Bw and the Bg horizons are silt loam, loam, sandy loam, or fine sandy loam. Few to many brown, red, or black concretions are in the Bg horizon.

The Cg horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 or less. This horizon has few to many mottles in shades of gray or brown, or it is mottled in shades of brown and gray. Texture is fine sandy loam, sandy loam, or loam.

Leeper Series

The Leeper series consists of deep, somewhat poorly drained, very slowly permeable soils that formed in clayey alluvium. These level soils are on flood plains in the Blackland Prairie. An apparent high water table is at a depth of 12 to 24 inches from January through March. Leeper soils are occasionally flooded during this period. The native vegetation is mixed hardwoods. Slopes are 0 to 1 percent.

Leeper soils are associated with Marietta, Tuscumbia, and Urbo soils. Marietta soils are on narrow flood plains. They have a fine-loamy control section and are moderately well drained. Tuscumbia soils are on the lower flood plains. They have mixed mineralogy and are poorly drained. Urbo soils are in similar positions on the landscape as Leeper soils. They have mixed mineralogy and are more acid throughout.

Typical pedon of Leeper silty clay, occasionally flooded, in a soybean field; NE1/4NW1/4SW1/4 sec. 18, T. 8 S., R. 21 W.

Ap—0 to 8 inches; dark brown (10YR 4/3) silty clay; moderate medium granular and subangular blocky structure; firm; common fine and medium roots; neutral; clear smooth boundary.
Bg1—8 to 19 inches; dark grayish brown (10YR 4/2) silty clay; few fine prominent yellowish brown mottles; moderate medium subangular blocky structure; firm, sticky and plastic; common fine and medium roots; neutral; gradual smooth boundary.
Bg2—19 to 35 inches; dark grayish brown (10YR 4/2) silty clay; common fine distinct yellowish brown and few fine distinct grayish brown mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few pressure faces on some peds; common fine and medium roots; mildly alkaline; clear smooth boundary.
Bg3—35 to 45 inches; dark grayish brown (10YR 4/2) clay; common medium faint dark gray (10YR 4/1) and common fine distinct yellowish brown mottles; moderate medium subangular blocky structure; very firm, sticky and plastic; few nonintersecting slickensides; few fine and medium roots; mildly alkaline; gradual smooth boundary.
Cg1—45 to 63 inches; gray (10YR 5/1) clay; common medium distinct dark grayish brown (10YR 4/2) and yellowish brown (10YR 5/6) mottles; massive; very firm, sticky and plastic; pressure faces on some peds; few nonintersecting slickensides; few fine roots; few fine dark brown concretions; mildly alkaline; clear smooth boundary.
Cg2—63 to 72 inches; gray (10YR 5/1) clay; common coarse distinct yellowish brown (10YR 5/6) mottles;

massive; very firm, sticky and plastic; pressure faces on some peds; few nonintersecting slickensides; few fine roots; few fine dark brown concretions; mildly alkaline.

The thickness of the solum ranges from 20 to 50 inches. Reaction is medium acid to moderately alkaline throughout.

The A horizon has hue of 10YR, value of 4, and chroma of 1 to 3; or hue of 10YR, value of 5, and chroma of 3; or hue of 2.5Y, value of 4, and chroma of 2.

The Bg horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2. Mottles are few to many in shades of brown and gray. Texture is silty clay or clay.

The Cg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2; or hue of 2.5Y, value of 6, and chroma of 2; or this horizon is mottled in shades of gray, yellow and brown. Texture is clay or silty clay.

Macon Series

The Macon series consists of deep, well drained, slowly permeable soils that formed in marine sediment. These gently sloping to moderately steep soils are on ridgetops and hillsides that are transitional areas between the Coastal Plain and the Blackland Prairie. The native vegetation is pines and mixed hardwoods. Slopes are 3 to 20 percent.

Macon soils are associated with Oktibbeha and Sacul soils. Oktibbeha soils are on a less dissected landscape. They have a very-fine control section and are moderately well drained. Sacul soils are in higher positions on the landscape than Macon soils. They have a clayey control section and are moderately well drained.

Typical pedon of Macon fine sandy loam, 8 to 20 percent slopes, in a wooded area; NW1/4NW1/4NW1/4 sec. 25, T. 9 S., R. 22 W.

A—0 to 7 inches; dark grayish brown (10YR 4/2) fine sandy loam; moderate medium granular structure; very friable; many fine and medium roots; medium acid; clear smooth boundary.

Bt1—7 to 11 inches; yellowish red (5YR 4/6) clay loam; moderate medium subangular blocky structure; very friable; thick patchy clay film on faces of peds; common fine roots, strongly acid; gradual smooth boundary.

Bt2—11 to 26 inches; yellowish red (5YR 5/6) clay loam; moderate medium subangular blocky structure; firm; thick patchy clay film on faces of peds; common fine roots; strongly acid; gradual smooth boundary.

Bt3—26 to 44 inches; yellowish red (5YR 5/6) clay loam; common medium prominent pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; firm; thick patchy clay film on faces of peds; strongly acid; gradual smooth boundary.

Bt4—44 to 62 inches; strong brown (7.5YR 5/6) sandy clay loam; common medium distinct pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; friable; thin patchy clay film on faces of peds; strongly acid; gradual wavy boundary.

BC—62 to 72 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; thin patchy clay film on faces of peds; strongly acid.

The thickness of the solum and the depth to bedrock range from 60 to 80 inches or more. Reaction ranges from medium acid to very strongly acid throughout.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3.

The Bt1 horizon has hue of 5YR, value of 4, and chroma of 4 or 6; or hue of 7.5YR, value of 4, and chroma of 4. Texture is clay loam, sandy clay loam, or loam. The Bt2 horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4 or 6; or hue of 7.5YR, value of 4 or 5, and chroma of 4 or 6. Texture is clay loam, sandy clay loam, or loam. The Bt3 horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 or 8; or hue of 7.5YR, value of 5, and chroma of 6 or 8. Mottles in shades of brown, red and yellow range from few to common. Texture is clay loam, sandy clay loam, sandy clay, silty clay loam, or clay. The Bt4 horizon has hue of 5YR, value of 4 or 5, and chroma of 6 or 8; or hue of 7.5YR, value of 5, and chroma of 6 or 8; or hue of 10YR, value of 5, and chroma of 6 or 8. Mottles are in shades of brown, red, and gray. Texture is clay loam, sandy clay loam, sandy clay, or clay. The BC horizon has hue of 10YR, value of 5 or 6, and chroma of 4 or 6; or hue of 2.5Y, value of 5, and chroma of 4 or 6. Mottles are in shades of red, brown, and gray. Black and brown nodules range from few to common. Texture is clay loam, sandy clay loam, sandy clay, or clay.

Magnet Series

The Magnet series consists of moderately deep to deep, well drained, moderately slowly permeable soils that formed in residuum from syenite and other intrusive igneous rocks. These gently sloping to steep soils are on ridgetops, foot slopes, and side slopes of a 3-ring dike complex in the Ouachita Mountains. The native vegetation is mixed hardwoods and a few pines. Slopes are 3 to 40 percent.

Magnet soils are adjacent to and associated with Bismarck, Carnasaw, Pirum, Sherless, and Sherwood soils. These soils are on the outer edge of the ring dike complex. Bismarck soils are on the lower side slopes and in the valleys. These soils have a loamy-skeletal control section and are less than 20 inches deep to weathered shale bedrock. Carnasaw soils are on side slopes. These soils have a clayey control section and

are 40 to 60 inches deep to shale bedrock. Pirum and Sherwood soils are on ridgetops and side slopes. Pirum soils have a fine-loamy control section and are 22 to 50 inches deep to hard sandstone bedrock. Sherwood soils have a fine-loamy control section and are 30 to 60 inches deep to hard sandstone bedrock. Sherless soils are in the valleys and on side slopes and low ridges. Sherless soils have a fine-loamy control section and are 20 to 40 inches deep to soft sandstone and shale bedrock.

Typical pedon of Magnet loam, 3 to 8 percent slopes, in an idle area; SW1/4NW1/4NW1/4 sec. 17, T. 3 S., R. 17 W.

Ap—0 to 4 inches; dark reddish brown (5YR 3/4) loam; moderate fine granular structure; friable; many fine roots; about 5 percent, by volume, subrounded cobbles and gravel; strongly acid; clear smooth boundary.

A—4 to 8 inches; dark reddish brown (5YR 3/4) loam; weak medium subangular blocky structure; friable; common fine roots; about 5 percent, by volume, subrounded cobbles and gravel; strongly acid; gradual smooth boundary.

Bt1—8 to 23 inches; reddish brown (5YR 4/4) clay; moderate medium subangular blocky structure; firm; thin continuous clay film on faces of peds; few fine roots; about 5 percent, by volume, subrounded cobbles and gravel; slightly acid; gradual smooth boundary.

Bt2—23 to 31 inches; about 75 percent reddish brown (5YR 4/3) clay loam; strong medium subangular blocky structure; firm; thin continuous clay film on faces of peds; 2 to 4 inches wide wedge-shaped vertical seams, peds coated with dark stains; about 5 percent, by volume, subrounded cobbles and gravel; soft, multicolored syenitic saprolite in small irregularly-shaped pockets in about 25 percent of total mass; strongly acid; abrupt irregular boundary.

Cr/Bt—31 to 72 inches; about 85 percent soft, multicolored syenitic saprolite; reddish brown (5YR 4/3) clay loam seams about 2 inches thick and 24 inches apart in about 15 percent of mass; weak medium subangular blocky structure; firm; thin continuous clay film on ped faces; strongly acid.

The thickness of the solum and the depth to soft, weathered bedrock range from 20 to 50 inches and is extremely variable over short distances. The depth to hard bedrock is more than 60 inches. Reaction ranges from slightly acid to strongly acid throughout. The content of coarse fragments ranges from 5 to 30 percent throughout.

The A or Ap horizon has hue of 7.5YR, value of 3 or 4, and chroma of 2 or 4; or hue of 5YR, value of 3 or 4, and chroma of 2 to 4. Texture is loam or stony loam. An A horizon that has value of less than 3 is less than 6 inches thick.

The Bt horizon has hue of 5YR, value of 4 or 5, and chroma of 3, 4, or 6; or hue of 2.5YR, value of 4 or 5, and chroma of 4 or 6. Texture is silty clay loam, silty clay, clay, clay loam, or their gravelly or cobbly analogs. The upper 20 inches of the argillic horizon averages 40 to 55 percent clay. If the paralithic contact is at a depth where the argillic horizon is less than 20 inches thick, the clay content also will average 40 to 55 percent.

The Cr horizon is extremely variable over short distances. This horizon is dominantly made up of soft, multicolored syenitic saprolite or of other igneous rocks of variable mineral composition.

Marietta Series

The Marietta series consists of deep, moderately well drained, moderately permeable soils that formed in loamy alluvium. These level soils are on flood plains in the Blackland Prairie. An apparent high water table is at a depth of 18 to 24 inches from January through March. Marietta soils are occasionally flooded in the winter and spring. The native vegetation is mixed hardwoods and mixed broadleaf softwoods. Slopes are 0 to 1 percent.

Marietta soils are associated with Leeper and Urbo soils. Leeper and Urbo soils are on flood plains and have a fine control section. Leeper soils are somewhat poorly drained. Urbo soils are very slowly permeable.

Typical pedon of Marietta fine sandy loam, occasionally flooded, in a hay meadow; NW1/4SW1/4NW1/4 sec. 18, T. 8 S., R. 20 W.

Ap1—0 to 6 inches; brown (10YR 5/3) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; medium acid; clear smooth boundary.

Ap2—6 to 11 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine granular structure; friable; many fine roots; medium acid; clear smooth boundary.

Bw1—11 to 18 inches; dark brown (10YR 4/3) silty clay loam; weak fine subangular blocky structure; friable; common fine roots; slightly acid; clear smooth boundary.

Bw2—18 to 22 inches; mottled dark brown (10YR 4/3), yellowish brown (10YR 5/4), and light brownish gray (10YR 6/2) silty clay loam; moderate medium subangular blocky structure; firm; common fine roots; few dark brown concretions; slightly acid; gradual smooth boundary.

Bg—22 to 36 inches; mottled light brownish gray (10YR 6/2) and yellowish brown (10YR 5/4) loam; moderate medium subangular blocky structure; firm; few fine roots; few dark brown concretions; neutral; gradual wavy boundary.

Cg1—36 to 58 inches; mottled gray (10YR 6/1) and dark yellowish brown (10YR 4/4) clay loam; massive;

firm; few dark brown concretions; mildly alkaline; gradual wavy boundary.
Cg2—58 to 72 inches; gray (10YR 5/1) clay loam; few fine distinct yellowish brown mottles; massive; firm; few dark brown concretions; mildly alkaline.

The thickness of the solum ranges from 28 to 60 inches. Reaction ranges from medium acid to mildly alkaline throughout.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3; or hue of 10YR, value of 5, and chroma of 4.

The Bw1 horizon has hue of 10YR, value of 4, and chroma of 3 or 4; or hue of 10YR, value of 5 and chroma of 3. Grayish mottles are few to common. The Bw2 horizon has colors that are similar to those of the Bw1 horizon, or it is mottled in shades of gray, brown, and yellow. The Bg horizon has hue of 10YR, value of 5 or 6 and chroma of 1 or 2; or hue of 2.5Y, value of 5 or 6, and chroma of 2; or the Bg horizon is mottled in shades of gray, brown, and yellow. Texture of the Bw and Bg horizons is loam, silty clay loam, sandy clay loam, or clay loam. Few to common black and brown concretions are in the lower part of the Bw horizon.

The Cg horizon has colors that are similar to those of the Bg horizon. Texture is clay loam, silty clay loam, sandy clay loam, or sandy clay. Few to common black and brown concretions are in the Cg horizon.

Mayhew Series

The Mayhew series consists of deep, poorly drained, very slowly permeable soils that formed in acid, clayey marine sediment underlain by clay shale. These level to nearly level soils are on upland flats in the Coastal Plain. An apparent high water table is at the surface or within a depth of 12 inches from January through March. The native vegetation is pines and mixed hardwoods. Slopes are 0 to 2 percent.

Mayhew soils are associated with Eutaw and Wilcox soils. Eutaw soils are in similar positions on the landscape as Mayhew soils. They have a very-fine control section, have intersecting slickensides, and are underlain by marly clay. Wilcox soils are in higher positions on the landscape, are somewhat poorly drained, and are slowly permeable.

Typical pedon of Mayhew silty clay loam, 0 to 2 percent slopes, in a wooded area; SW1/4SW1/4SW1/4 sec. 34, T. 9 S., R. 20 W.

A—0 to 3 inches; dark grayish brown (10YR 4/2) silty clay loam; moderate medium granular structure; friable; common fine and few medium roots; few iron-manganese concretions; strongly acid; abrupt smooth boundary.
Btg1—3 to 7 inches; gray (10YR 6/1) silty clay; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; thick patchy clay film on faces of peds; common fine pores; common fine and few medium roots; common iron-manganese concretions; very strongly acid; clear smooth boundary.
Btg2—7 to 18 inches; gray (10YR 6/1) silty clay; common medium distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; thick patchy clay film on faces of peds; few fine roots; common fine pores; common iron-manganese concretions; very strongly acid; gradual smooth boundary.
Btg3—18 to 38 inches; gray (10YR 6/1) silty clay; common medium distinct strong brown (7.5YR 5/6) mottles; strong medium subangular blocky structure; firm; sticky and plastic; thick patchy clay film on faces of peds; few fine pores; few fine roots; common fine iron-manganese concretions; very strongly acid; gradual wavy boundary.
Btg4—38 to 50 inches; light brownish gray (10YR 6/2) silty clay; common medium distinct yellowish brown (10YR 5/8) silty clay; strong medium angular blocky structure; firm, sticky and plastic; thick patchy clay film on faces of peds; common nonintersecting slickensides; few fine pores; few fine roots; few fine iron-manganese concretions; very strongly acid; gradual wavy boundary.
BCg—50 to 63 inches; light brownish gray (10YR 6/2) silty clay; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; thick patchy clay film on faces of peds; few fine pores; few fine roots; few fine iron-manganese concretions; 10 percent, by volume, clay shale fragments; very strongly acid; abrupt smooth boundary.
Cr—63 to 72 inches; olive yellow (5Y 6/6) platy, clayey shale that can be easily cut with a spade.

The thickness of the solum and the depth to clayey shale range from 40 to 80 inches or more. Reaction is medium acid to very strongly acid throughout.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2; or hue of 10YR, value of 3 or 4, and chroma of 1; or hue of 10YR, value of 5, and chroma of 3. Mottles, if present, are in shades of brown.

The Btg1 and Btg2 horizons have hue of 10YR, value of 5 or 6, and chroma of 1 or 2; or hue of 10YR, value of 4, and chroma of 1. Texture is silty clay loam, silty clay, or clay. The Btg3, Btg4, BCg, or Cg horizons have colors that are similar to those of the Btg1 and Btg2 horizons, or these horizons are mottled in shades of gray, yellow, and brown. Texture is silty clay, clay, or silty clay loam. Content of shale fragments ranges from 0 to 10 percent.

The Cr horizon is soft, platy, gray, yellow, or brown clayey shale that can be easily cut with a spade.

McLaurin Series

The McLaurin series consists of deep, well drained, moderately permeable soils that formed in marine sediment. These nearly level soils are on ridgetops in the Coastal Plain. The native vegetation is pines and mixed hardwoods. Slopes are 1 to 3 percent.

McLaurin soils are associated with Darden and Smithdale soils. Darden soils are in slightly higher positions on the landscape than McLaurin soils. They have a sandy control section and do not have an argillic horizon. Smithdale soils are in similar positions on the landscape and have a fine-loamy control section.

Typical pedon of McLaurin loamy fine sand, 1 to 3 percent slopes; SE1/4SW1/4NE1/4 sec. 15, T. 9 S., R. 19 W.

Ap—0 to 9 inches; brown (10YR 5/3) loamy fine sand; moderate medium granular structure; very friable; common medium and fine roots; slightly acid; clear smooth boundary.

EB—9 to 15 inches; brownish yellow (10YR 6/6) fine sandy loam; moderate medium granular structure; very friable; common medium and fine roots; very strongly acid; clear smooth boundary.

Bt1—15 to 25 inches; yellowish red (5YR 5/8) fine sandy loam; weak medium subangular blocky structure; very friable; few thin patchy clay films on faces of peds; few sand grains bridged with clay; common fine roots; very strongly acid; gradual smooth boundary.

Bt2—25 to 48 inches; yellowish red (5YR 5/8) sandy loam; moderate medium subangular blocky structure; very friable; common thin patchy clay film on faces of peds; sand grains bridged with clay; common fine roots; very strongly acid; gradual smooth boundary.

B/E—48 to 66 inches; yellowish red (5YR 5/6) sandy loam; weak medium subangular blocky structure; very friable; pockets and streaks of pale brown (10YR 6/3) loamy fine sand in about 15 percent of the volume; common fine roots; very strongly acid; gradual smooth boundary.

B't—66 to 72 inches; yellowish red (5YR 5/6) sandy loam; common medium distinct red (2.5YR 5/8) mottles; weak medium subangular blocky structure; very friable; sand grains bridged with clay; few fine roots; very strongly acid.

The thickness of the solum ranges from 60 to 80 inches or more. Reaction is strongly acid or very strongly acid throughout except where the surface layer has been limed. The content of coarse fragments ranges from 0 to 10 percent, by volume.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 3, 4, or 6. The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. A horizon that has value of 3 is less than 6 inches thick.

The EB horizon has hue of 10YR, value of 5 or 6, and chroma of 4, 6, or 8; or hue of 7.5YR, value of 5, and chroma of 6. Texture is fine sandy loam or loamy fine sand.

The Bt horizon has hue of 10R or 2.5YR, value of 4 or 5, and chroma of 4, 6, or 8; or hue of 5YR, value of 4 or 5, and chroma of 4 or 6; or hue of 5YR, value of 5, and chroma of 8. Texture is loam, fine sandy loam, or sandy loam. The B part of the B/E horizon has colors that are similar to those of the Bt horizon. The E part of the B/E horizon has hue of 10YR, value of 6 to 8, and chroma of 3, 4, 6, or 8; or hue of 7.5YR, value of 6 or 7, and chroma of 4, 6, or 8. The E part makes up 10 to 25 percent of the volume of the B/E horizon. Texture is sandy loam, fine sandy loam, or loamy sand. The B't horizon has hue of 2.5YR or 10R, value of 4 or 5, and chroma of 4, 6, or 8; or hue of 5YR, value of 4 or 5, and chroma of 4 or 6; or hue of 5YR, value of 5, and chroma of 8. Texture is sandy loam, loam, or sandy clay loam.

Nugent Series

The Nugent series consists of deep, excessively drained, moderately rapidly permeable soils that formed in sandy alluvium. These level soils are on flood plains in the Coastal Plain and in transitional areas to the Ouachita Mountains. An apparent high water table is within a depth of 42 inches of the surface from January through April. Nugent soils are frequently flooded for brief periods in the winter and early in the spring. The native vegetation is cottonwood, willow, and sweetgum trees. Slopes are 0 to 1 percent.

Nugent soils are associated with Ochlockonee and Toine soils. Ochlockonee soils generally are farther from the stream channel. They have a coarse-loamy control section and are well drained. Toine soils generally are farther from the stream channel. They have a fine-loamy control section and are well drained.

Typical pedon of Nugent loamy fine sand, frequently flooded, in a pasture area; NW1/4SE1/4NE1/4 sec. 23, T. 8 S., R. 19 W.

A—0 to 5 inches; dark grayish brown (10YR 4/2) loamy fine sand; weak fine granular structure; very friable; few fine roots; very strongly acid; abrupt smooth boundary.

C1—5 to 12 inches; yellowish brown (10YR 5/6) loamy sand; single grained; loose; very friable; very thin strata of very fine sandy loam; strongly acid; clear smooth boundary.

C2—12 to 26 inches; dark yellowish brown (10YR 4/4) loamy sand; single grained; loose; very friable; very thin strata of loamy very fine sand; strongly acid; clear smooth boundary.

C3—26 to 45 inches; yellowish brown (10YR 5/4) loamy fine sand; single grained; loose; very friable; very

thin strata of very fine sandy loam; strongly acid; gradual smooth boundary.

C4—45 to 58 inches; yellowish brown (10YR 5/6) loamy sand; single grained; loose; very friable; very thin strata of very fine sandy loam; strongly acid; clear smooth boundary.

C5—58 to 72 inches; yellowish brown (10YR 5/6) loamy fine sand; single grained; loose; very friable; very thin strata of very fine sandy loam; strongly acid.

Reaction ranges from very strongly acid to slightly acid.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 2 or 3.

The C horizon has hue of 10YR, value of 5 to 7, and chroma of 3 or 4; or hue of 10YR, value of 4, and chroma of 4; or hue of 10YR, value of 5, and chroma of 6; or hue of 7.5YR, value of 5, and chroma of 6 or 8. Texture is sand or loamy sand that has thin strata of fine sandy loam, very fine sandy loam, loam, or silt loam. The content of coarse fragments ranges from 0 to 10 percent, by volume. In some pedons, the lower part of the C horizon has thin strata of gravel.

Ochlockonee Series

The Ochlockonee series consists of deep, well drained, moderately permeable soils that formed in loamy alluvium. These level soils are on flood plains in the Coastal Plain and in transitional areas to the Ouachita Mountains. An apparent high water table is within a depth of 36 inches of the surface from December through April. These soils are occasionally flooded for very brief periods in the winter and spring. The native vegetation is mixed hardwoods and a few pines. Slopes are 0 to 1 percent.

Ochlockonee soils are associated with Iuka, Nugent, and Ouachita soils. Iuka soils are in slightly lower positions on the landscape than Ochlockonee soils. They are moderately well drained and are moderately permeable. Nugent soils are closer to the stream channel. They have a sandy control section and are excessively drained. Ouachita soils are in similar positions on the landscape. They have a fine-silty control section and a cambic horizon.

Typical pedon of Ochlockonee fine sandy loam, occasionally flooded, in an idle area; SW1/4SE1/4NE1/4 sec. 36, T. 9 S., R. 18 W.

Ap—0 to 6 inches; brown (10YR 5/3) fine sandy loam; moderate medium granular structure; very friable; many fine and medium roots; common fine and medium pores; slightly acid; abrupt smooth boundary.

A—6 to 12 inches; yellowish brown (10YR 5/4) fine sandy loam; moderate medium granular structure; friable; many fine and medium roots; common fine and medium pores; strongly acid; abrupt smooth boundary.

C—12 to 35 inches; dark brown (10YR 4/3) fine sandy loam; massive; friable; common fine and medium roots; common fine pores; 1/8 inch to 1/4 inch strata of silt loam in lower part; strongly acid; gradual smooth boundary.

Ab—35 to 44 inches; dark brown (10YR 4/3) fine sandy loam; common fine faint yellowish brown mottles; weak fine granular structure; friable; few fine roots; few fine pores; few fine dark brown concretions; strongly acid; clear smooth boundary.

2C—44 to 72 inches; pale brown (10YR 6/3) loamy sand; common medium faint yellowish brown (10YR 5/4) mottles; massive; very friable; 1/8 inch to 1/4 inch strata of silt loam throughout; strongly acid.

Reaction ranges from strongly acid to very strongly acid except where the surface layer has been limed. Darker colored buried horizons are common at a depth of 25 to 45 inches.

The A or Ap horizon has hue of 2.5Y or 7.5YR, value of 4 to 6, and chroma of 2 or 4; or hue of 10YR, value of 3 to 6, and chroma of 2, 3, or 5. Soils that have an A horizon less than 6 inches thick and have value of 3 are within the defined range of the series.

The 2C horizon has hue of 2.5Y or 7.5YR, value of 4 to 6, and chroma of 4 or 6; or hue of 10YR, value of 4 to 6, and chroma of 3, 4, or 6. Texture is sandy loam, fine sandy loam, or loamy sand. Mottles in shades of brown, yellow, and gray range from none to common and are at a depth of more than 20 inches. Strata within the 2C horizon range from loamy sand to silty clay loam. Gravelly strata are common at a depth of more than 40 inches.

Oktibbeha Series

The Oktibbeha series consists of moderately deep to deep, moderately well drained, very slowly permeable soils that formed in acid, clayey marine sediment underlain by marl and chalk. These gently sloping to moderately sloping soils are on eroded ridgetops and side slopes in the Blackland Prairie. The native vegetation is pines and mixed hardwoods. Slopes are 3 to 12 percent.

Oktibbeha soils are associated with Demopolis, Eutaw, Kipling, and Macon soils. Demopolis soils are on the more severely eroded landscapes. These soils have a loamy-skeletal control section, are carbonitic, and are moderately slowly permeable. Eutaw soils are in lower positions on the landscape than the Oktibbeha soils. These soils are poorly drained and are deeper to marl or chalk than Oktibbeha soils. Kipling soils are in slightly lower positions on the landscape, have a fine control section, and are somewhat poorly drained. Macon soils

are on a more dissected landscape. These soils have a fine-loamy control section and are slowly permeable.

Typical pedon of Oktibbeha fine sandy loam, 3 to 8 percent slopes, eroded; SW1/4NE1/4SW1/4 sec. 33, T. 8 S., R. 22 W.

Ap—0 to 3 inches; brown (10YR 5/3) fine sandy loam; weak medium granular and subangular blocky structure; friable; common fine and medium roots; strongly acid; clear smooth boundary.

Bt1—3 to 9 inches; yellowish red (5YR 5/8) clay; few fine prominent light yellowish brown mottles; strong medium angular and subangular blocky structure; very firm, sticky and plastic; thick continuous clay film on faces of peds; common fine and medium roots; very strongly acid; gradual smooth boundary.

Bt2—9 to 22 inches; yellowish red (5YR 5/8) clay; common fine prominent yellowish brown (10YR 5/6) and light brownish gray (10YR 6/2) mottles; strong medium angular and subangular blocky structure; very firm, sticky and plastic; thick continuous clay film on faces of peds; few pressure faces on peds; common fine and medium roots; very strongly acid; gradual smooth boundary.

Bt3—22 to 32 inches; yellowish red (5YR 5/8) clay; common fine prominent light brownish gray (10YR 6/2) and common medium prominent yellowish brown (10YR 5/6) mottles; strong medium angular and subangular blocky structure; very firm, sticky and plastic; thick continuous clay film on faces of peds; common nonintersecting slickensides; few fine and medium roots; very strongly acid; gradual smooth boundary.

Bt4—32 to 43 inches; mottled yellowish brown (10YR 5/6) and light brownish gray (10YR 6/2) clay; moderate medium subangular blocky structure; very firm, sticky and plastic; thick continuous clay film on faces of peds; common nonintersecting slickensides; few fine and medium roots; very strongly acid; clear wavy boundary.

C—43 to 49 inches; mottled light olive brown (2.5Y 5/6) and yellowish brown (10YR 5/6) clay; massive; firm, sticky and plastic; few fine roots; moderately alkaline; calcareous; abrupt wavy boundary.

Cr—49 to 60 inches; soft, platy, light olive brown (2.5Y 5/6) chalk that can be cut with a spade.

The thickness of the solum over marly clay or soft chalk ranges from 20 to about 50 inches. Reaction ranges from very strongly acid to slightly acid in the A and B horizons and from neutral to moderately alkaline in the C horizon.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4; or hue of 7.5YR, value of 3 to 5, and chroma of 2 or 4.

The Bt1 and Bt2 horizons have hue of 2.5YR, value of 4 or 5, and chroma of 4, 6, or 8; or hue of 5YR, value of 4 or 5, and chroma of 3, 4, or 6; or hue of 5YR, value of 5, and chroma of 8; or has hue of 7.5YR, value of 4 or 5, and chroma of 4 or 6; or hue of 7.5YR, value of 5, and chroma of 8. Mottles are in shades of brown in the Bt1 horizon and in the upper part of the Bt2 horizon. Mottles are in shades of gray in the lower part of the Bt2 horizon. The Bt3 horizon has colors that are similar to those of the Bt1 and Bt2 horizons. It also has hue of 10YR, value of 5 or 6, and chroma of 4, 6, or 8. This horizon has many mottles in shades of brown and gray, or it is mottled in shades of brown, red, and gray. In some pedons, the matrix of the Bt3 horizon is gray. The Bt4 horizon is mottled in shades of red, brown, yellow, and gray.

The C horizon has hue of 10YR or 5Y, value of 5 to 7, and chroma of 3, 4, 6, or 8; or hue of 2.5Y, value of 5 to 7, and chroma of 4 or 6; or hue of 2.5Y, value of 6 or 7, and chroma of 8. This horizon has few to many mottles in shades of gray and brown, or it is mottled in shades of olive, brown, and gray. Texture is clay or silty clay. The Cr horizon is soft, platy, olive, brown, and gray chalk.

Ora Series

The Ora series consists of deep, moderately well drained, moderately slowly permeable soils that formed in acid marine sediment. These gently sloping soils are on ridgetops and side slopes in the Coastal Plain. A perched high water table is at a depth of 24 to 42 inches from February to April. The native vegetation is pines and mixed hardwoods. Slopes are 3 to 8 percent.

Ora soils are associated with Sacul and Savannah soils. Sacul soils are on a more dissected landscape. They have a fine control section, have mixed mineralogy, and do not contain a fragipan. Savannah soils are in slightly lower positions on the landscape than Ora soils. They have a strong brown to yellowish brown argillic horizon.

Typical pedon of Ora fine sandy loam, 3 to 8 percent slopes, in a pasture area; 100 feet south of road; SW1/4NE1/4NE1/4 sec. 21, T. 10 S., R. 19 W.

Ap—0 to 4 inches; brown (10YR 5/3) fine sandy loam; few organic stains; moderate medium granular structure; very friable; many medium and fine roots; medium acid; clear smooth boundary.

E—4 to 8 inches; yellowish brown (10YR 5/4) loam, weak medium granular structure; friable; many medium and fine roots; strongly acid; clear smooth boundary.

Bt—8 to 29 inches; yellowish red (5YR 5/6) clay loam; moderate medium subangular blocky structure; firm; thick patchy clay film on faces of peds; common fine roots; common fine pores; strongly acid; clear smooth boundary.

Btx1—29 to 41 inches; mottled red (2.5YR 4/6), yellowish brown (10YR 5/6) and light brownish gray (10YR 6/2) loam; weak coarse prismatic parting to

strong medium subangular blocky structure; firm, hard, brittle and compact in about 65 percent of the volume; thick patchy clay film on faces of peds; few fine roots in seams; very strongly acid; gradual smooth boundary.

Btx2—41 to 72 inches; mottled red (2.5YR 4/6), brownish yellow (10YR 6/6), and gray (10YR 6/1) loam, weak coarse prismatic parting to strong medium subangular blocky structure; firm, hard, brittle and compact in about 70 percent of the volume; thick patchy clay film on faces of peds; few fine roots in seams; common fine pores; few iron-manganese concretions; very strongly acid.

The thickness of the solum ranges from 40 to 80 inches. The depth to the fragipan ranges from 18 to 42 inches. Reaction ranges from strongly acid to extremely acid except where the surface layer has been limed.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. Undisturbed pedons have an A horizon that has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. The A horizon is less than 6 inches thick.

The E horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. Texture is fine sandy loam or loam.

The BE horizon, if present, has hue of 7.5YR, value of 5, and chroma of 6. Texture is fine sandy loam, or loam. The Bt horizon has hue of 2.5YR, value of 4 or 5, and chroma of 4, 6, or 8; or hue of 5YR, value of 4 or 5, and chroma of 4 or 6; or hue of 5YR, value of 5, and chroma of 8. Texture is clay loam, sandy clay loam, or loam.

The Btx horizon and the C horizon, if present, are mottled in shades of yellow, brown, gray, and red, or these horizons have yellowish red to yellowish brown matrix colors that are mottled in shades of gray and red. The texture of these horizons is sandy clay loam, loam, or sandy loam. Black and brown concretions range from none to common in the fragipan. A few fine to coarse quartz pebbles are in some pedons.

Ouachita Series

The Ouachita series consists of deep, well drained, moderately slowly permeable soils that formed in alluvial sediment. These level to nearly level soils are on flood plains and low terraces in the Coastal Plain. The Ouachita soils are rarely to occasionally flooded in the winter and spring. The native vegetation is hardwoods and a few pines. Slopes are 0 to 3 percent.

Ouachita soils are associated with Guyton, Iuka, Ochlockonee, and Sardis soils. Guyton soils are in lower positions on the landscape than Ouachita soils. These soils have an argillic horizon and are poorly or very poorly drained. Iuka and Ochlockonee soils are in similar positions on the landscape as Ouachita soils and have a coarse-loamy control section. In addition, Iuka soils are moderately well drained, and Ochlockonee soils do not have a cambic horizon. Sardis soils are on a slightly lower part of the flood plain. They are somewhat poorly drained.

Typical pedon of Ouachita silt loam, occasionally flooded, in a wooded area; NW1/4SE1/4NW1/4 sec. 3, T. 11 S., R. 18 W.

A—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam; few dark organic stains; moderate medium granular structure; friable; many fine and medium roots; strongly acid; clear smooth boundary.

Bw1—6 to 11 inches; dark brown (10YR 4/3) silty clay loam; weak medium subangular blocky structure; firm; common medium and fine roots; few fine pores; strongly acid; clear smooth boundary.

Bw2—11 to 40 inches; dark yellowish brown (10YR 4/4) silty clay loam; common fine distinct pale brown and yellowish brown mottles; moderate medium subangular blocky structure; firm; common fine and few medium roots; few fine pores; few iron-manganese concretions; strongly acid; clear smooth boundary.

Bw3—40 to 59 inches; yellowish brown (10YR 5/4) silty clay loam; common fine faint dark yellowish brown and few fine distinct light brownish gray mottles; moderate medium subangular blocky structure; firm; few fine roots; common fine and medium pores; few iron-manganese concretions; very strongly acid; clear smooth boundary.

Bw4—59 to 72 inches; dark yellowish brown (10YR 4/4) silty clay loam; common medium distinct light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; firm; few fine roots; few fine pores; few iron-manganese concretions; very strongly acid.

The thickness of the solum ranges from 40 to 72 inches or more. Reaction is strongly acid or very strongly acid throughout.

The A horizon has hue of 10YR, value of 4, and chroma of 2 to 4; or hue of 10YR, value of 5, and chroma of 3.

The Bw horizon has hue of 10YR, value of 4 to 6, and chroma of 3; or hue of 10YR, value of 4, and chroma of 4; or hue of 10YR, value of 5, and chroma of 4, 6, or 8. Mottles that have chroma of 2 or less are common at a depth of more than 24 inches. Texture is silt loam, loam, or silty clay loam.

Ozan Series

The Ozan series consists of deep, poorly drained, slowly permeable soils that formed in alluvial sediment. These level to depressional soils are on flood plains and low stream terraces in the Coastal Plain. A perched high water table is at a depth of 12 to 30 inches from December through May. The Ozan soils are occasionally flooded in the winter and spring. The native vegetation is

mixed hardwoods and a few pines. Slopes are 0 to 1 percent.

Ozan soils are associated with Kirkville soils. Kirkville soils are in slightly higher positions on the flood plain than Ozan soils. They do not have an argillic horizon and are moderately well drained.

Typical pedon of Ozan fine sandy loam, occasionally flooded, in a wooded area; SE1/4NE1/4SE1/4 sec. 17, T. 9 S., R. 19 W.

A—0 to 7 inches; light brownish gray (10YR 6/2) fine sandy loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; many medium and fine roots; few fine pores; few iron-manganese concretions; very strongly acid; clear smooth boundary.

Eg—7 to 17 inches; gray (10YR 6/1) fine sandy loam; common medium distinct yellowish brown (10YR 5/4) mottles; moderate medium subangular blocky structure; friable; many medium and fine roots; few fine pores; few iron-manganese concretions; very strongly acid; clear irregular boundary.

Btg/Eg—17 to 39 inches; light brownish gray (10YR 6/2) loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; thin patchy clay film on faces of peds; tongues of fine sandy loam 1 to 4 inches wide in about 20 percent of horizon; few medium and fine roots; few fine pores; few iron-manganese concretions; very strongly acid; gradual smooth boundary.

Btg1—39 to 53 inches; gray (10YR 6/1) sandy clay loam; common medium distinct pale brown (10YR 6/3) mottles and common fine prominent yellowish brown mottles; moderate medium subangular blocky structure; friable; thick patchy clay film on faces of peds; few fine roots; few fine pores; few iron-manganese concretions; very strongly acid; gradual smooth boundary.

Btg2—53 to 72 inches; gray (10YR 6/1) sandy clay loam; many coarse distinct yellowish brown (10YR 5/4) mottles; moderate medium subangular blocky structure; firm; thick patchy clay film on faces of peds; few fine roots; few fine pores; few iron-manganese concretions; very strongly acid.

The thickness of the solum ranges from 60 to 72 inches or more. Reaction is very strongly acid to medium acid throughout.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 2.

The Eg horizon has hue of 10YR, value of 6, and chroma of 1 or 2; or hue of 10YR, value of 7, and chroma of 1. Texture is loam, fine sandy loam, or sandy loam.

The Btg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. Mottles are in shades of brown. Texture is sandy loam or loam throughout this horizon, but there is also sandy clay loam or clay loam in the lower part of the Btg horizon. Tongues of the Eg horizon extend into the upper part of the Btg horizon. They are 1 to 5 inches wide in the upper part of the horizon and taper with depth to about 1/2 inch in the lower part.

Pikeville Series

The Pikeville series consists of deep, well drained, moderately permeable soils that formed in gravelly and loamy marine sediment. These nearly level to gently sloping soils are on hilltops in the Coastal Plain. The native vegetation is pines and mixed hardwoods. Slopes are 1 to 8 percent.

Pikeville soils are associated with Sacul and Saffell soils. Saffell soils are on more narrow hilltops and upper side slopes. They have a loamy-skeletal control section. Sacul soils are on side slopes. They have a clayey control section and are moderately well drained.

Typical pedon of Pikeville fine sandy loam, 3 to 8 percent slopes, in a pasture; NE1/4SE1/4NE1/4 sec. 31, T. 7 S., R. 21 W.

Ap—0 to 4 inches; dark brown (10YR 4/3) fine sandy loam; moderate medium granular structure; friable; common fine and medium roots; about 2 percent, by volume, subrounded gravel; very strongly acid; clear smooth boundary.

Bt1—4 to 11 inches; yellowish red (5YR 4/6) loam; moderate medium subangular blocky structure; firm; common thick clay film on faces of peds; common fine and medium roots; about 2 percent, by volume, subrounded gravel; very strongly acid; gradual smooth boundary.

Bt2—11 to 35 inches; red (2.5YR 4/8) gravelly loam; moderate medium subangular blocky structure; firm; common thick clay film on faces of peds; common fine and medium roots; about 15 percent, by volume, subrounded gravel; very strongly acid; gradual smooth boundary.

Bt3—35 to 46 inches; red (2.5YR 5/8) gravelly loam; moderate medium subangular blocky structure; firm; common thick clay film on faces of peds; common fine and medium roots; about 20 percent, by volume, subrounded gravel; very strongly acid; abrupt wavy boundary.

Bt4—46 to 72 inches; red (2.5YR 5/8) extremely gravelly loam; moderate medium subangular blocky structure; very firm; common thick clay film on faces of peds and on gravel surfaces; few fine roots; about 80 percent, by volume, of subrounded gravel; few skeletans; very strongly acid.

The thickness of the solum is more than 72 inches. The depth to horizons that contain more than 25 percent

gravel ranges from 30 to 48 inches. Reaction is strongly acid or very strongly acid throughout.

The A or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 to 4. An A horizon that has value of 3 is less than 6 inches thick.

The E horizon, if present, has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is fine sandy loam, sandy loam, or loam.

The BE horizon, if present, has hue of 7.5YR, value of 4 or 5, and chroma of 4; or hue of 7.5YR, value of 5, and chroma of 5 or 6; or hue of 10YR, value of 4 or 5, and chroma of 4 or 6; or hue of 10YR, value of 5, and chroma of 8. The Bt1 horizon has hue of 7.5YR, value of 5, and chroma of 6 or 8; or hue of 5YR, value of 4, and chroma of 6; or hue of 5YR, value of 5, and chroma of 6 or 8; or hue of 2.5YR, value of 4 or 5, and chroma of 6 or 8. Texture is sandy clay loam, clay loam, loam, or their gravelly analogs. Gravel content ranges from 0 to 25 percent. The Bt2 horizon has hue of 5YR, value of 4, and chroma of 6; or hue of 5YR, value of 5, and chroma of 6 or 8; or hue of 2.5YR, value of 4 or 5, and chroma of 6 or 8. Texture is gravelly loam, gravelly sandy clay loam, or their very gravelly analogs. Gravel content ranges from 15 to 40 percent, by volume. The Bt3 and Bt4 horizons have hue of 5YR, value of 4, and chroma of 6; or hue of 5YR, value of 5, and chroma of 6 or 8; or hue of 2.5YR, value of 4 or 5, and chroma of 6 or 8. Texture is gravelly sandy loam, gravelly loam, gravelly sandy clay loam, or their very gravelly or extremely gravelly analogs. Gravel content ranges from 15 to 80 percent, by volume.

Pirum Series

The Pirum series consists of moderately deep to deep, well drained, moderately permeable soils that formed in residuum of sandstone that has lenses of shale. These gently sloping to moderately steep soils are on ridgetops and lower side slopes of the Ouachita Mountains. The native vegetation is pines and mixed hardwoods. Slopes are 3 to 20 percent.

Pirum soils are associated with Bonnerdale, Carnasaw, Clebit, Sherless, Shermore, Sherwood, and Zafra soils. Bonnerdale soils are in slightly lower positions on the landscape than Pirum soils, have a coarse-loamy control section, and are somewhat poorly drained. Carnasaw soils are on the lower hillsides and in the valleys, have a clayey control section, and are slowly permeable. Clebit soils are on the very narrow ridgetops and slope breaks, have a loamy-skeletal control section, and are less than 20 inches deep to hard sandstone bedrock. Sherless, Shermore, and Sherwood soils are in similar positions on the landscape as Pirum soils. Sherless soils have a yellowish red argillic horizon and are underlain by soft sandstone bedrock. Shermore soils are moderately well drained and have a fragipan. Sherwood soils have a yellowish red subsoil. Zafra soils are on a more dissected landscape and have a loamy-skeletal control section.

Typical pedon of Pirum fine sandy loam, in a wooded area of Pirum-Zafra-Clebit complex, 3 to 8 percent slopes; SW1/4SW1/4NW1/4 sec. 17, T. 6 S., R. 21 W.

A—0 to 5 inches; dark grayish brown (10YR 4/2) fine sandy loam; moderate medium granular structure; very friable; about 10 percent, by volume, small sandstone fragments; strongly acid; clear smooth boundary.

BE—5 to 10 inches; brownish yellow (10YR 6/6) fine sandy loam; weak medium subangular blocky structure; friable; about 5 percent, by volume, small sandstone fragments; very strongly acid; clear smooth boundary.

Bt1—10 to 29 inches; yellowish brown (10YR 5/8) loam; moderate medium subangular blocky structure; firm; thick patchy clay film on faces of peds; about 10 percent, by volume, small sandstone fragments; very strongly acid; gradual smooth boundary.

Bt2—29 to 42 inches; yellowish brown (10YR 5/6) loam; moderate medium subangular blocky structure; friable; thick patchy clay film on faces of peds; about 10 percent, by volume, small sandstone fragments; very strongly acid; clear wavy boundary.

R—42 to 44 inches; hard, tilted and fractured sandstone bedrock that has lenses of shale.

The thickness of the solum and the depth to bedrock range from 22 to 50 inches. Fragments of sandstone or shale, 1 to 6 inches across, range from 0 to 30 percent, by volume, throughout. Reaction ranges from medium acid to very strongly acid throughout.

The A horizon has hue of 10YR, value of 4, and chroma of 2 to 4; or hue of 10YR, value of 5, and chroma of 3. The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is fine sandy loam or gravelly fine sandy loam.

The E horizon, if present, has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. Texture is sandy loam, fine sandy loam, loam, or their gravelly analogs.

The BE horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 or 8. Texture is fine sandy loam, loam, or their gravelly analogs. The Bt horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 or 8. Texture is sandy clay loam, loam, clay loam, or their gravelly analogs. The Bt horizon has an irregular lower boundary and is variable over short distances.

The R horizon is hard, tilted and fractured sandstone bedrock that has lenses of shale.

Ruston Series

The Ruston series consists of deep, well drained, moderately permeable soils that formed in loamy marine sediment. These nearly level to gently sloping soils are

on hilltops in the Coastal Plain. The native vegetation is pines and mixed hardwoods. Slopes are 1 to 8 percent.

Ruston soils are associated with Sacul and Smithdale soils. Sacul soils are in similar positions on the landscape as Ruston soils. They have a clayey control section and are moderately well drained. Smithdale soils are on a more dissected landscape. They have a decrease in clay within a depth of 60 inches.

Typical pedon of Ruston fine sandy loam, in an area of Sacul-Ruston association, undulating, in a pasture; NW1/4SW1/4NW1/4 sec. 15, T. 8 S., R. 18 W.

Ap—0 to 5 inches; dark brown (10YR 4/3) fine sandy loam; weak medium granular structure; friable; many fine and medium roots; strongly acid; clear smooth boundary.

E—5 to 13 inches; pale brown (10YR 6/3) fine sandy loam, weak medium subangular blocky structure; friable; many fine and medium roots; very strongly acid; clear smooth boundary.

Bt—13 to 25 inches; yellowish red (5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; friable; thick patchy clay film on faces of peds; common fine roots; very strongly acid; clear wavy boundary.

Bt/E—25 to 30 inches; yellowish red (5YR 4/6) sandy clay loam; pockets of pale brown (10YR 6/3) fine sandy loam in about 20 percent of horizon; moderate medium subangular blocky structure; friable; thick patchy clay film on faces of peds; few fine roots; very strongly acid; clear smooth boundary.

B't—30 to 63 inches; mottled pale brown (10YR 6/3), yellowish red (5YR 5/6), and dark red (2.5YR 3/6) sandy clay loam; moderate medium subangular blocky structure; friable; few fine roots; very strongly acid; clear wavy boundary.

C—63 to 72 inches; mottled red (2.5YR 4/6), light brownish gray (10YR 6/2), and dark red (2.5YR 3/6) loam; massive; very strongly acid.

The thickness of the solum is more than 60 inches. The B/E horizon is within the defined range for the series. Reaction ranges from very strongly acid to slightly acid in the A and E horizons and from very strongly acid to medium acid in the Bt, B't, and C horizons. Coarse fragments of ironstone or quartz gravel ranges from 0 to 15 percent, by volume, throughout.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. Texture is fine sandy loam, sandy loam, or very fine sandy loam.

The Bt and B't horizons have hue of 5YR, value of 4, and chroma of 4 or 6; or hue of 5YR, value of 5, and chroma of 6 or 8; or hue of 2.5YR, value of 4 or 5, and chroma of 4, 6, or 8. Texture is sandy clay loam, loam, or clay loam. The B't horizon in most pedons is mottled in shades of gray, brown, red, or yellow. The E part of the Bt/E horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. Texture is fine sandy loam, loamy sand, or sandy loam. The E part of the Bt/E horizon occurs in streaks and pockets and makes up as much as 50 percent of the horizon.

The C horizon is mottled in shades of gray, red, or brown. Texture is loam, sandy clay loam, or clay loam.

Sacul Series

The Sacul series consists of deep, moderately well drained, slowly permeable soils that formed in acid marine deposits. These gently sloping to moderately steep soils are on hilltops and side slopes in the Coastal Plains. A seasonal high water table is at a depth of 24 to 48 inches from December through April. The native vegetation is pines and mixed hardwoods. Slopes are 3 to 20 percent.

Sacul soils are associated with Bowie, Cuthbert, Darden, Macon, Ora, Saffell, Sawyer, Smithdale, and Wilcox soils. Bowie, Ora, Sawyer, Smithdale, and Wilcox soils are on a less dissected landscape than Sacul soils. Bowie soils have a fine-loamy control section and contain more than 5 percent plinthite; Ora soils have a fine-loamy control section and have a fragipan; Sawyer soils have fine-silty control section; Smithdale soils have a fine-loamy control section and are well drained; and Wilcox soils have a fine control section and are somewhat poorly drained. Cuthbert soils are in steeper positions on the landscape than Sacul soils, have sola less than 40 inches thick, and are well drained. Darden soils are in similar positions on the landscape, have a sandy control section, and are excessively drained; Macon soils are in lower positions, have a fine-loamy control section, and are well drained; and Saffell soils are on hilltops and the upper side slopes, have a loamy-skeletal control section, are well drained, and are moderately permeable.

Typical pedon of Sacul fine sandy loam, in a wooded area of Sacul-Smithdale association, rolling; NE1/4NE1/4NW1/4 sec. 3, T. 10 S., R. 18 W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) fine sandy loam; moderate medium granular structure; very friable; common medium and fine roots; strongly acid; clear smooth boundary.

E—4 to 8 inches; yellowish brown (10YR 5/4) fine sandy loam; weak medium granular structure; very friable; common fine and medium roots; strongly acid; clear smooth boundary.

Bt1—8 to 18 inches; red (2.5YR 4/8) silty clay; strong medium subangular blocky structure; firm; common thick clay film on faces of peds; common fine and few medium roots; few fine pores; strongly acid; clear smooth boundary.

Bt2—18 to 37 inches; red (2.5YR 4/8) silty clay; few fine prominent light brownish gray mottles; strong medium subangular blocky structure; firm; common thick clay film on faces of peds; common fine and few medium roots; few fine pores; very strongly acid; gradual smooth boundary.
Bt3—37 to 55 inches; yellowish red (5YR 5/6) silty clay; common medium prominent gray (10YR 6/1) mottles; strong medium subangular blocky structure; firm; common thick clay film on faces of peds; few fine and medium roots; few fine pores; very strongly acid; gradual smooth boundary.
BC—55 to 72 inches; mottled gray (10YR 6/1) and yellowish red (5YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm; few thick clay films on faces of peds; few fine and medium roots; few fine pores; few sandstone fragments; very strongly acid.

The thickness of the solum ranges from 40 to 72 inches or more. Reaction is strongly acid or very strongly acid throughout. Fragments of ironstone or quartz gravel, 2 to 75 millimeters across, range from 0 to 20 percent, by volume, in the A and E horizons and from 0 to 10 percent, by volume, in the Bt, BC, and C horizons.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. Texture is fine sandy loam or gravelly fine sandy loam.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 3 or 4. Texture is fine sandy loam, sandy loam, loam, or their gravelly analogs.

The Bt1 horizon has hue of 2.5YR, value of 4 or 5, and chroma of 6 or 8; or hue of 2.5YR, value of 3, and chroma of 6; or hue of 5YR, value of 4 or 5, and chroma of 6; or hue of 5YR, value of 5, and chroma of 8. The Bt2 horizon has matrix colors that are similar to those of the Bt1 horizon. The Bt2 horizon has mottles in shades of gray. Texture of the Bt1, Bt2, and Bt3 horizons is silty clay or clay. The Bt3 and BC horizons are mottled in shades of brown, red, and gray. The colors in these horizons range from about equal to either a dominant red or a dominant gray. Texture is silty clay loam, clay loam, sandy clay loam, or silt loam.

The C horizon, if present, is stratified and is mottled in shades of red, yellow, and gray. Texture is clay loam, sandy clay loam, sandy loam, or clayey shale.

Saffell Series

The Saffell series consists of deep, well drained, moderately permeable soils that formed in gravelly and loamy marine or fluvial sediment. These gently sloping to moderately steep soils are on hilltops and upper side slopes in the Coastal Plain and in transitional areas to the Ouachita Mountains. The native vegetation is pines and mixed hardwoods. Slopes are 3 to 20 percent.

Saffell soils are associated with Pikeville and Sacul soils. Pikeville soils are on broad ridgetops and have a fine-loamy control section. Sacul soils are in lower positions on the landscape than Saffell soils. They have a clayey control section, are moderately well drained, and are slowly permeable.

Typical pedon of Saffell gravelly fine sandy loam, 3 to 8 percent slopes, in a wooded area; NE1/4SE1/4SE1/4 sec. 11, T. 6 S., R. 16 W.

A—0 to 6 inches; dark grayish brown (10YR 4/2) gravelly fine sandy loam; moderate medium granular structure; friable; many fine and medium roots; about 20 percent, by volume, quartz pebbles; strongly acid; clear smooth boundary.
BE—6 to 11 inches; yellowish brown (10YR 5/4) gravelly fine sandy loam; weak fine subangular blocky structure; friable; many fine and medium roots; about 25 percent, by volume, quartz pebbles; strongly acid; clear smooth boundary.
Bt1—11 to 39 inches; yellowish red (5YR 5/8) very gravelly sandy clay loam; moderate medium subangular blocky structure; firm; few fine roots; about 55 percent, by volume, quartz pebbles; common thin patchy clay film on faces of peds and on surfaces of pebbles; very strongly acid; gradual smooth boundary.
Bt2—39 to 57 inches; yellowish red (5YR 5/6) very gravelly sandy clay loam; moderate medium subangular blocky structure; firm; few fine roots; about 60 percent, by volume, quartz pebbles; common thin patchy clay film on faces of peds and on surfaces of pebbles; very strongly acid; clear wavy boundary.
C—57 to 72 inches; reddish yellow (7.5YR 6/8) extremely gravelly sandy loam; massive; friable; about 75 percent, by volume, quartz pebbles; very strongly acid.

The thickness of the solum ranges from 35 to 60 inches. Reaction is strongly acid or very strongly acid throughout.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2, 3, 4, or 6; or hue of 7.5YR, value of 4 or 5, and chroma of 2, 4, or 6. Coarse fragments range from 15 to 35 percent, by volume.

The BE horizon has hue of 10YR or 5YR, value of 4 or 5, and chroma of 4 or 6. Texture is gravelly fine sandy loam, gravelly sandy clay loam, gravelly loam, or their very gravelly analogs. Coarse fragments range from 15 to 60 percent, by volume. The Bt1 and Bt2 horizons have hue of 2.5YR, value of 4 to 6, and chroma of 4, 6, or 8; or hue of 7.5YR or 5YR, value of 4 to 6, and chroma of 4 or 6; or hue of 7.5YR or 5YR, value of 5 or 6, and chroma of 8. Texture is very gravelly sandy clay loam, very gravelly loam, very gravelly fine sandy loam, or very gravelly clay loam. Coarse fragments range from 35 to 60 percent, by volume.

The color of the C horizon is the same as that of the Bt horizon. Mottles, if present, are in shades of red, brown, or yellow. Texture is very gravelly sandy loam or extremely gravelly sandy loam. Coarse fragments range from 50 to 80 percent, by volume.

Sardis Series

The Sardis series consists of deep, somewhat poorly drained, moderately permeable soils that formed in loamy alluvium. These level to nearly level soils are on flood plains and low terraces in the Coastal Plain and in transitional areas to the Ouachita Mountains. An apparent high water table is at a depth of 12 to 36 inches from January through May. The Sardis soils are rarely to occasionally flooded for brief periods from December through May. The native vegetation is mixed hardwoods. Slopes are 0 to 3 percent.

Sardis soils are associated with Guyton, Kirkville, and Ouachita soils. Guyton soils are on lower elevations. They have an argillic horizon and are poorly or very poorly drained. Kirkville soils are on the upstream part of the flood plain. They have a coarse-loamy control section and are moderately well drained. Ouachita soils are on the slightly higher part of the flood plain. They are well drained.

Typical pedon of Sardis silt loam, occasionally flooded, in a wooded area; SE1/4NE1/4NE1/4 sec. 4, T. 11 S., R. 18 W.

A—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium granular structure; friable; many medium and fine roots; few fine pores; few iron-manganese concretions; medium acid; clear smooth boundary.

Bw1—6 to 13 inches; yellowish brown (10YR 5/4) silt loam; common fine distinct light brownish gray mottles; weak medium subangular blocky structure; friable; common medium and fine roots; few fine pores; few iron-manganese concretions; medium acid; clear smooth boundary.

Bw2—13 to 25 inches; yellowish brown (10YR 5/6) silty clay loam; common coarse distinct gray (10YR 6/1) and few fine distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm, brittle in about 30 percent of mass; common fine and few medium roots; few fine pores; few iron-manganese concretions; strongly acid; gradual smooth boundary.

Bw3—25 to 39 inches; yellowish brown (10YR 5/6) silty clay loam; common coarse distinct gray (10YR 6/1) and few fine distinct strong brown mottles; moderate medium subangular blocky structure; firm, brittle in about 30 percent of mass; common fine and few medium roots; few fine pores; common iron-manganese concretions; very strongly acid; gradual smooth boundary.

Bw4—39 to 54 inches; mottled yellowish brown (10YR 5/8) and gray (10YR 6/1) silty clay loam; moderate medium subangular blocky structure; firm; few fine and medium roots; few fine pores; few iron-manganese concretions; very strongly acid; gradual wavy boundary.

Bw5—54 to 65 inches; mottled yellowish brown (10YR 5/6) and gray (10YR 6/1) silty clay loam; moderate medium subangular blocky structure; firm; few fine roots; few fine pores; very strongly acid; gradual smooth boundary.

C—65 to 72 inches; mottled gray (10YR 6/1) and yellowish brown (10YR 5/6) loam; massive; firm; few fine roots; few fine pores; few iron-manganese concretions; very strongly acid.

The thickness of the solum ranges from 40 to 70 inches. Reaction ranges from medium acid to very strongly acid throughout.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3.

The Bw horizon has hue of 10YR, value of 4 to 6, and chroma of 3, 4, or 6; or hue of 10YR, value of 5 or 6, and chroma of 8; or hue of 7.5YR, value of 4 to 6, and chroma of 4 or 6; or hue of 7.5YR, value of 5 or 6, and chroma of 8. This horizon has mottles in shades of gray or brown. Mottles that have chroma of 2 or less are at a depth of 8 to 24 inches. The lower subhorizons of the Bw horizon may be mottled in shades of gray or brown with no dominate matrix color. Texture is silt loam, silty clay loam, or clay loam.

The C horizon colors are variable. They range from a gray matrix that has mottles in shades of brown to a yellowish brown or dark yellowish brown matrix that has mottles in shades of gray. Texture is silt loam, loam, fine sandy loam, or sandy loam.

Savannah Series

The Savannah series consists of deep, moderately well drained, moderately permeable to moderately slowly permeable soils that formed in loamy marine sediment. These nearly level to gently sloping soils are on ridgetops and side slopes in the Coastal Plain. A perched high water table is at a depth of 18 to 36 inches from January through March. The native vegetation is pines and mixed hardwoods. Slopes are 1 to 8 percent.

Savannah soils are associated with Bowie, Ora, Sawyer, and Trebloc soils. Bowie soils are in similar positions on the landscape as Savannah soils. Bowie soils contain more than 5 percent plinthite and do not have a fragipan. Ora soils are in slightly higher positions on the landscape. Ora soils have a yellowish red subsoil. Sawyer soils are in similar positions on the landscape, have a fine-silty control section, and do not have a fragipan. Trebloc soils are in slightly lower positions,

have a fine-silty control section, do not have a fragipan, and are poorly drained.

Typical pedon of Savannah fine sandy loam, 3 to 8 percent slopes, in a forest area; SE1/4SW1/4NW1/4 sec. 21, T. 10 S., R. 19 W.

A—0 to 5 inches; dark brown (10YR 4/3) fine sandy loam; few organic stains; moderate medium granular structure; very friable; many medium and fine roots; strongly acid; clear smooth boundary.

E—5 to 8 inches; brown (10YR 5/3) fine sandy loam; weak medium granular structure; friable; many medium and fine roots; strongly acid; clear smooth boundary.

Bt1—8 to 15 inches; yellowish brown (10YR 5/8) loam; moderate medium subangular blocky structure; firm; thick patchy clay film on faces of peds; common fine roots; common fine pores; strongly acid; clear smooth boundary.

Bt2—15 to 25 inches; yellowish brown (10YR 5/6) loam; few fine pale brown mottles; moderate medium subangular blocky structure; firm; thick patchy clay film on faces of peds; common fine roots; common fine pores; strongly acid; clear smooth boundary.

Btx1—25 to 37 inches; mottled yellowish brown (10YR 5/6), light brownish gray (10YR 6/2), and red (2.5YR 4/6) loam; weak coarse prismatic parting to strong medium subangular blocky structure; firm, hard, brittle and compact in about 65 percent of the volume; thick patchy clay film on faces of peds; few fine roots in seams; common fine pores; few iron-manganese concretions; less than 1 percent, by volume, plinthite; very strongly acid; clear smooth boundary.

Btx2—37 to 49 inches; mottled red (2.5YR 4/8), gray (10YR 6/1), and yellowish brown (10YR 5/6) loam; weak coarse prismatic parting to strong medium subangular blocky structure; firm, hard, brittle and compact in about 65 percent of the volume; thick patchy clay film on faces of peds; few fine roots in seams; common fine pores; few iron-manganese concretions; less than 1 percent, by volume, plinthite; very strongly acid; clear smooth boundary.

Btx3—49 to 69 inches; mottled yellowish brown (10YR 5/6), gray (10YR 6/1), and red (2.5YR 4/6) loam; weak coarse prismatic parting to strong medium subangular blocky structure; firm, hard, brittle and compact in about 75 percent of the volume; thick patchy clay film on faces of peds; few fine roots in seams; common fine pores; few iron-manganese concretions; less than 1 percent, by volume, plinthite; very strongly acid; clear smooth boundary.

Btx4—69 to 72 inches; mottled red (2.5YR 4/6), gray (10YR 6/1), and brownish yellow (10YR 6/6) sandy clay loam; weak coarse prismatic parting to strong medium subangular blocky structure; firm, hard, brittle and compact in about 60 percent of the volume; thick patchy clay film on faces of peds; few fine roots in seams; common fine pores; few iron-manganese concretions; less than 1 percent, by volume, plinthite; very strongly acid.

The thickness of the solum ranges from 50 to 72 inches or more. The depth to the fragipan ranges from 16 to 38 inches. Reaction is strongly acid or very strongly acid throughout. In some pedons there are few quartz pebbles throughout, and in others there are few to common brown and black concretions throughout.

The A horizon has hue of 10YR, value of 4, and chroma of 2 or 3; or hue of 10YR, value of 5, and chroma of 3 or 4.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. Texture is fine sandy loam, sandy loam, or loam.

The Bt horizon has hue of 7.5YR or 10YR, value of 5, and chroma of 4, 6, or 8. Texture is sandy clay loam, clay loam, or loam. The Btx horizon is mottled in shades of yellow, brown, red, and gray, or it has hue of 10YR, value of 5, and chroma of 4, 6, or 8. This horizon has mottles in shades of gray. Texture is sandy clay loam, clay loam, or loam.

Sawyer Series

The Sawyer series consists of deep, moderately well drained, slowly permeable soils that formed in acid marine sediment. These nearly level to gently sloping soils are on hilltops and hillsides in the Coastal Plain. A perched high water table is at a depth of 24 to 36 inches from December through April. The native vegetation is pines and mixed hardwoods. Slopes are 1 to 8 percent.

Sawyer soils are associated with Sacul and Savannah soils. Sacul soils are on a more dissected landscape than Sawyer soils and have a clayey control section. Savannah soils are in similar positions on the landscape, have a fine-loamy control section, and have a fragipan.

Typical pedon of Sawyer loam, 3 to 8 percent slopes, in a meadow; NW1/4SW1/4SE1/4 sec. 13, T. 8 S., R. 22 W.

Ap—0 to 5 inches; brown (10YR 5/3) loam; moderate medium granular structure; friable; many fine and medium roots; few dark brown iron-manganese concretions; strongly acid; clear smooth boundary.

Bt1—5 to 17 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm; common fine and few medium roots; common thick clay film on faces of peds; few dark brown iron-manganese concretions; very strongly acid; gradual smooth boundary.

Bt2—17 to 29 inches; yellowish brown (10YR 5/6) silty clay loam; common fine distinct gray and common medium prominent yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; firm;

few fine roots common thick clay film on faces of peds; few dark brown iron-manganese concretions; very strongly acid; clear wavy boundary.

Bt3—29 to 61 inches; mottled yellowish brown (10YR 5/8), gray (10YR 6/1), and yellowish red (5YR 5/8) silty clay; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; common thick clay film on faces of peds; few dark brown iron-manganese concretions; very strongly acid; gradual smooth boundary.

Bt4—61 to 72 inches; mottled red (2.5YR 4/8), gray (10YR 6/1), and yellowish brown (10YR 5/8) clay; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; common thick clay film on faces of peds; few dark brown iron-manganese concretions; very strongly acid.

The thickness of the solum ranges from 60 to 72 inches or more. Reaction ranges from extremely acid to strongly acid throughout.

The A horizon has hue of 10YR, value of 4, and chroma of 2 or 3. The Ap horizon has hue of 10YR, value of 5, and chroma of 2 or 3.

The Bt1 horizon has hue of 10YR, value of 5, and chroma of 4, 6, or 8; or hue of 7.5YR, value of 5, and chroma of 6 or 8. Mottles in shades of gray range from none to few. The Bt2 horizon has hue of 10YR, value of 5, and chroma of 4, 6, or 8; or hue of 7.5YR, value of 5, and chroma of 6 or 8. Mottles in shades of gray, brown, and red range from few to many. Texture of the Bt1 and Bt2 horizon is silt loam, loam, silty clay loam, or clay loam. The Bt3 and Bt4 horizons are mottled in shades of red, brown, and gray, or one of these colors is dominant and is mottled with the other two colors. Texture is silty clay or clay. The depth to the clayey Bt3 horizon is 22 to 40 inches.

Sherless Series

The Sherless series consists of moderately deep, well drained, moderately permeable soils that formed in residuum of soft sandstone that has lenses of shale. These gently sloping soils are on ridgetops of the Ouachita Mountains. The native vegetation is pines and mixed hardwoods. Slopes are 3 to 8 percent.

Sherless soils are associated with Bismarck, Bonnerdale, Carnasaw, Pirum, and Shermore soils. Bismarck soils are in lower positions on the landscape and in the valleys. These soils have a loamy-skeletal control section and are less than 20 inches deep to soft shale bedrock. Bonnerdale soils are in lower positions on the landscape, have a coarse-loamy control section, and are more than 40 inches deep to soft shale bedrock. Carnasaw soils are on the lower side slopes and in the valleys, have a clayey control section, and are more than 40 inches deep to soft shale bedrock. Pirum soils are in similar positions as Sherless soils, have a yellowish brown subsoil underlain by hard sandstone bedrock. Shermore soils are in slightly lower positions, have a fragipan, and are moderately well drained.

Typical pedon of Sherless fine sandy loam, in an area of Pirum-Sherless-Shermore fine sandy loams, 3 to 8 percent slopes, in a meadow; NW1/4SW1/4NW1/4 sec. 5, T. 5 S., R. 19 W.

A—0 to 5 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; about 5 percent, by volume, sandstone fragments; strongly acid; clear smooth boundary.

E—5 to 14 inches; light yellowish brown (10YR 6/4) fine sandy loam; moderate medium granular structure; very friable; common fine and medium roots; about 5 percent, by volume, sandstone fragments; strongly acid; clear smooth boundary.

Bt—14 to 31 inches; yellowish red (5YR 5/8) clay loam; moderate medium subangular blocky structure; firm; thick patchy clay film on faces of peds; about 5 percent, by volume, sandstone fragments; very strongly acid; gradual wavy boundary.

Cr—31 to 33 inches; soft, tilted and fractured sandstone bedrock that has lenses of shale.

The thickness of the solum ranges from 20 to 40 inches underlain by acid, soft sandstone bedrock that has intrusions of shale. Reaction ranges from very strongly acid to slightly acid in the A horizon and from very strongly acid to medium acid in the E horizon, and it is strongly acid or very strongly acid in the B horizon. The content of the gravel ranges from 5 to 20 percent, by volume, throughout.

The A horizon has hue of 10YR, value of 3 or 4, and chroma or 2 or 3. Fragments of sandstone range from 5 to 15 percent, by volume.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 4. Texture is fine sandy loam or gravelly fine sandy loam. Fragments of sandstone range from 5 to 20 percent, by volume.

The BE horizon, if present, has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 or 8. Texture is fine sandy loam, loam, or their gravelly analogs. The Bt horizon has hue of 5YR or 7.5YR, value of 5 or 6, and chroma of 6 or 8. Mottles in shades of red and brown range from none to many in the lower part of the Bt horizon. Texture is clay loam, sandy clay loam, gravelly clay loam, or gravelly sandy clay loam.

The Cr horizon is soft, tilted and fractured sandstone that has lenses of shale.

Shermore Series

The Shermore series consists of deep, moderately well drained, moderately slowly permeable soils that formed in residuum of sandstone and shale. These gently sloping soils are on ridgetops, side slopes,

benches, and fans in the Ouachita Mountains. A perched high water table is at a depth of 18 to 42 inches from November through April. The native vegetation is pines and mixed hardwoods. Slopes are 3 to 8 percent.

Shermore soils are associated with Avilla, Pirum, and Sherless soils. Avilla soils are on stream terraces at lower elevations than Shermore soils, do not have a fragipan, and have a lower base saturation. Pirum and Sherless soils are in slightly higher positions on the landscape than Shermore soils, have a solum less than 60 inches deep to bedrock, are well drained, and do not have a fragipan.

Typical pedon of Shermore fine sandy loam, in a wooded area of Pirum-Sherless-Shermore fine sandy loams, 3 to 8 percent slopes; SE1/4SE1/4NW1/4 sec. 34, T. 6 S., R. 22 W.

Ap—0 to 4 inches; dark brown (10YR 4/3) fine sandy loam; moderate medium granular structure, very friable; many fine and medium roots; strongly acid; clear smooth boundary.

Bt—4 to 20 inches; yellowish brown (10YR 5/8) loam; moderate medium subangular blocky structure; friable; common medium roots; thin patchy clay film on faces of peds; very strongly acid; gradual smooth boundary.

Btx—20 to 49 inches; strong brown (7.5YR 5/8) clay loam; common medium distinct gray (10YR 6/1) and yellowish brown (10YR 5/6) mottles; strong medium subangular blocky structure; firm and brittle; thin patchy clay film on faces of peds; very strongly acid; clear smooth boundary.

BC—49 to 71 inches; mottled gray (10YR 6/1) and strong brown (7.5YR 5/8) clay loam; moderate medium subangular blocky structure; firm; thin patchy clay film on faces of peds; 10 percent, by volume, rounded gravel and shale fragments; very strongly acid; clear wavy boundary.

Cr—71 to 73 inches; fractured and tilted shale bedrock that has lenses of sandstone.

The thickness of the solum is more than 60 inches. The depth to the fragipan is at a depth of 20 to 40 inches. Reaction ranges from strongly acid to slightly acid in the A and E horizons, from very strongly acid to slightly acid in the BE horizon, and from very strongly acid to medium acid in the Bt, Bx, and BC horizons. Fragments of sandstone that are less than 3 inches across range from 0 to 15 percent throughout.

The A or Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4; or hue of 7.5YR, value of 3 to 5, and chroma of 2 or 4.

The E horizon, if present, has hue of 10YR, value of 4 to 6, and chroma of 3 or 4; or hue of 7.5YR, value of 4 to 6, and chroma of 4. Texture is fine sandy loam or loam.

The BE horizon, if present, has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 6; or hue of 10YR or 7.5YR, value of 5, and chroma of 8. Texture is fine sandy loam or loam. The Bt horizon has hue of 5YR, 7.5YR, or 10YR, value of 4 or 5, and chroma of 4 or 6; or hue of 5YR, 7.5YR, or 10YR, value of 5, and chroma of 8. Mottles are in shades of yellow, red, brown, and gray. Texture is loam, clay loam, or sandy clay loam. The Btx horizon has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 4 or 6; or hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 8. This horizon has mottles in shades of red, yellow, brown, and gray that range from few to many, or it is mottled in shades of yellow, red, brown, and gray. Texture is loam, sandy clay loam, or clay loam. The BC horizon is coarsely mottled in hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 1, 2, 4, 6, or 8; or hue of 10YR, value of 5 to 7, and chroma of 3. Texture is fine sandy loam, loam, sandy clay loam, or clay loam.

The Shermore soils in this survey area were correlated as taxadjuncts to the Shermore series because the base saturation is dominantly less than 35 percent at a depth of 30 inches below the top of the fragipan. The base saturation of these soils ranges from 30 to to 40 percent. Use, management, and behavior of these soils are similar to those of the Shermore series.

Sherwood Series

The Sherwood series consists of moderately deep to deep, well drained, moderately permeable soils that formed in residuum of sandstone that has lenses of shale. These gently sloping to moderately sloping soils are on ridgetops and side slopes of the Ouachita Mountains. The native vegetation is pines and mixed hardwoods. Slopes are 3 to 12 percent.

Sherwood soils are associated with Avilla, Bismarck, Carnasaw, and Pirum soils. Avilla soils are on stream terraces and are more than 60 inches deep to bedrock. Bismarck soils are on the lower hillsides and in the valleys. These soils have a loamy-skeletal control section and are less than 20 inches deep to soft bedrock. Carnasaw soils are on the lower side slopes and in the valleys. These soils have a clayey control section. Pirum soils are in similar positions on the landscape as Sherwood soils and have a yellowish brown subsoil.

Typical pedon of Sherwood fine sandy loam, 3 to 8 percent slopes, in a pasture; NW1/4NE1/4SW1/4 sec. 1, T. 6 S., R. 20 W.

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) fine sandy loam; moderate medium granular structure; very friable; about 2 percent, by volume, sandstone fragments; medium acid; clear smooth boundary.

E—5 to 13 inches; yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; very friable; about 2 percent, by volume,

sandstone fragments, medium acid; clear smooth boundary.

Bt1—13 to 34 inches; yellowish red (5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; firm; common thin clay film on faces of peds; about 2 percent, by volume, sandstone fragments; very strongly acid; clear wavy boundary.

Bt2—34 to 42 inches; yellowish red (5YR 5/6) sandy clay loam; moderate medium subangular blocky structure; friable; about 2 percent, by volume, sandstone fragments; very strongly acid; clear wavy boundary.

BC—42 to 45 inches; yellowish red (5YR 5/6) gravelly loam; weak medium subangular blocky structure; friable; about 20 percent, by volume, sandstone fragments; very strongly acid; abrupt irregular boundary.

R—45 to 47 inches; hard, fractured and tilted sandstone bedrock.

The thickness of the solum ranges from 30 to 60 inches, and is extremely variable over short distances because of an irregular boundary between the soil and weathered bedrock. Coarse fragments that are less than 3 inches across range from 0 to 15 percent, by volume, in the A and E horizons, from 2 to 20 percent, by volume, in the BE and Bt1 horizons, and from 15 to 35 percent, by volume, in the Bt2 and BC horizons. Reaction ranges from very strongly acid to medium acid in the A and E horizons, and it is very strongly acid or strongly acid in the BE, Bt, and BC horizons.

The A or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. Texture is fine sandy loam or loam.

The BE horizon, if present, has hue of 7.5YR or 5YR, value of 5, and chroma of 4, 6, or 8. Texture is loam, clay loam, or their gravelly analogs. The Bt horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 4 or 6; or hue of 5YR or 2.5YR, value of 5, and chroma of 8. The upper part of the Bt horizon is clay loam, loam, sandy clay loam. The lower part is clay loam, loam, sandy clay loam, gravelly clay loam, gravelly loam, or gravelly sandy clay loam. The BC horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 4 or 6; or hue of 5YR or 2.5YR, value of 5, and chroma of 8. Texture is gravelly loam, gravelly clay loam, or gravelly sandy clay loam.

Smithdale Series

The Smithdale series consists of deep, well drained, moderately permeable soils that formed in loamy marine sediment. These gently sloping to moderately steep soils are on hilltops and the upper side slopes in the Coastal Plain. The native vegetation is pines and mixed hardwoods. Slopes are 3 to 20 percent.

Smithdale soils are associated with Bowie, Darden, McLaurin, Ruston, and Sacul soils. Bowie soils are in slightly lower positions on the landscape than Smithdale soils. These soils are moderately well drained and contain more than 5 percent plinthite. Darden soils are in similar positions on the landscape as the Smithdale soils, have a sandy control section, and do not have an argillic horizon. The McLaurin soils have a coarse-loamy control section. Sacul soils are on a more dissected landscape, have a clayey control section, and are moderately well drained. Ruston soils are on a less dissected landscape. These soils are bisequal.

Typical pedon of Smithdale fine sandy loam, 3 to 8 percent slopes, in a meadow; NE1/4SE1/4SW1/4 sec. 9, T. 4 S., R. 16 W.

Ap—0 to 7 inches; brown (10YR 5/3) fine sandy loam; moderate medium granular structure; very friable; many fine and medium roots; medium acid; clear smooth boundary.

Bt1—7 to 24 inches; yellowish red (5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; common thick clay film on faces of peds; many fine and medium roots; strongly acid; gradual smooth boundary.

Bt2—24 to 42 inches; yellowish red (5YR 4/8) sandy clay loam; moderate medium subangular blocky structure; friable; common thick clay film on faces of peds; common fine and medium roots; strongly acid; gradual smooth boundary.

Bt3—42 to 68 inches; yellowish red (5YR 4/8) sandy loam; moderate medium subangular blocky structure; friable; common thick clay film on faces of peds; common fine and medium roots; common pockets of uncoated sand grains; strongly acid; gradual smooth boundary.

Bt4—68 to 72 inches; yellowish red (5YR 5/8) sandy loam; moderate medium subangular blocky structure; friable; common thick clay film on faces of peds; common fine and medium roots; common pockets of uncoated sand grains; strongly acid.

The thickness of the solum ranges from 60 to 100 inches or more. Reaction is strongly acid or very strongly acid throughout except where the surface layer has been limed.

The A horizon has hue of 10YR, value of 4, and chroma of 1 to 3. In places, there is a thin A horizon that is less than 5 inches thick that has hue of 10YR, value of 3, and chroma of 1 or 2. The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4.

The E horizon, if present, has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. Texture is fine sandy loam, sandy loam, or loamy sand.

The upper part of the Bt horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6; or hue of 5YR or 2.5YR, value of 5, and chroma of 8. Few to common

mottles in shades of red and brown are in some pedons. Texture is clay loam, sandy clay loam, or loam. The lower part of the Bt horizon has colors that are similar to those in the upper part of the Bt horizon except few to many pockets of uncoated sand grains are present. Texture is loam and sandy loam. Gravel content throughout ranges from 0 to about 10 percent.

Smithton Series

The Smithton series consists of deep, poorly drained, moderately slowly permeable soils that formed in loamy fluvial or marine sediment. These level soils are on stream terraces and upland flats in the Coastal Plain. A perched high water table is at the surface or within a depth of 12 inches from December through May. Flooding can occur during periods of abnormally heavy rainfall. The native vegetation is mixed hardwoods and pines. Slopes are 0 to 1 percent.

Smithton soils are associated with Harleston and Stough soils. Harleston soils are in similar positions on the landscape as Smithton soils. These soils are moderately well drained and have moderate permeability. Stough soils are in similar positions on the landscape. These soils are somewhat poorly drained and are compact and brittle in 40 to 55 of the volume in the lower part of the Bt horizon.

Typical pedon of Smithton very fine sandy loam, 0 to 1 percent slopes, in a wooded area; SE1/4SE1/4SE1/4 sec. 25, T. 8 S., R. 18 W.

A—0 to 5 inches; dark grayish brown (10YR 4/2) very fine sandy loam; moderate medium granular structure; very friable; common fine and medium roots; common iron-manganese concretions; strongly acid; clear smooth boundary.

Eg—5 to 16 inches; light brownish gray (10YR 6/2) very fine sandy loam, common medium distinct yellowish brown (10YR 5/6) and few fine faint brown mottles; weak medium granular structure; very friable; common fine and medium roots; common iron-manganese concretions; very strongly acid; clear smooth boundary.

Btg1—16 to 38 inches; light brownish gray (10YR 6/2) loam; common coarse distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; few thin patchy clay film on faces of peds; common fine and medium pores; few fine roots; common iron-manganese concretions; strongly acid; clear wavy boundary.

Btg2—38 to 50 inches; light brownish gray (10YR 6/2) loam; common medium distinct yellowish brown (10YR 5/8) mottles; moderate medium angular and subangular blocky structure; firm; thick patchy clay film on faces of peds; common fine and medium pores; few fine roots; common iron-manganese concretions; very strongly acid; gradual wavy boundary.

Btg3—50 to 72 inches; grayish brown (10YR 5/2) loam; common medium distinct yellowish brown (10YR 5/6) and few fine distinct dark gray mottles; moderate medium angular and subangular blocky structure; firm; thick patchy clay film on faces of peds; common fine and medium pores; few fine roots; common iron-manganese concretions; very strongly acid.

The thickness of the solum is more than 60 inches. Reaction is strongly acid or very strongly acid throughout.

The A or Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 2.

The Eg horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. Texture is very fine sandy loam, fine sandy loam, or loam.

The BE horizon, if present, and the Btg1 horizons have hue of 10YR, value of 6, and chroma of 1 or 2. This horizon has common to many mottles in shades of brown. The Btg2 and Btg3 horizons have hue of 10YR, value of 5 or 6, and chroma of 1 or 2. Mottles are in shades of brown. Texture of the B horizon is fine sandy loam or loam. In some pedons, it is sandy clay loam.

Stough Series

The Stough series consists of deep, somewhat poorly drained, moderately slowly permeable soils that formed in loamy marine or fluvial sediment. These level to nearly level soils are on terraces and upland flats in the Coastal Plain. A perched high water table is at a depth of 12 to 18 inches from January through April. The Stough soils can be flooded during periods of abnormally heavy rainfall. The native vegetation is pines and mixed hardwoods. Slopes are 0 to 2 percent.

Stough soils are associated with Cahaba, Foley, Gurdon, Harleston, and Smithton soils. Cahaba soils are in slightly higher positions on the landscape than Stough soils, have a fine-loamy control section, and are well drained. Foley soils are in similar positions on the landscape, have a fine-silty control section, and have a natric horizon. Gurdon soils have a coarse-silty control section and are not brittle in the lower part of the subsoil. Harleston soils are in similar positions on the landscape, are moderately well drained, and do not have a subsoil that is compact and brittle. Smithton soils are in slightly lower positions on the landscape, are poorly drained, and do not have a subsoil that is compact and brittle.

Typical pedon of Stough fine sandy loam, 0 to 2 percent slopes, in a forest; NW1/4NW1/4SE1/4 sec. 30, T. 3 S., R. 16 W.

A—0 to 3 inches; dark grayish brown (10YR 4/2) fine sandy loam; moderate medium granular structure;

very friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

E—3 to 8 inches; grayish brown (10YR 5/2) fine sandy loam; common fine distinct yellowish brown mottles; moderate medium granular structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary.

Bt—8 to 22 inches; mottled yellowish brown (10YR 5/4), light brownish gray (10YR 6/2), and strong brown (7.5YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; thin patchy clay film on faces of peds; common fine and medium roots; strongly acid; clear wavy boundary.

Btx1—22 to 48 inches; mottled light brownish gray (10YR 6/2), brownish yellow (10YR 6/6), and strong brown (7.5YR 5/8) loam; moderate medium subangular blocky structure; firm, compact and brittle in about 45 percent of mass; few pockets of friable gray silt; thin patchy clay film on faces of peds; common fine and medium roots; very strongly acid; gradual wavy boundary.

Btx2—48 to 60 inches; mottled gray (10YR 6/1) and brownish yellow (10YR 6/8) loam, moderate medium subangular blocky structure; firm, compact and brittle in about 45 percent of mass; few pockets of friable gray silt, thick patchy clay film on faces of peds; few fine roots; very strongly acid; gradual wavy boundary.

Btx3—60 to 72 inches; mottled gray (10YR 6/1) and strong brown (7.5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; firm, compact and brittle in about 45 percent of the mass; few pockets of friable gray silt, thick patchy clay film on faces of peds; very strongly acid.

The thickness of the solum is more than 60 inches. Reaction is strongly acid or very strongly acid.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 1; or hue of 10YR, value of 4, and chroma of 2. The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2.

The E horizon has hue of 10YR, value of 6, and chroma of 3 or 4; or hue of 10YR, value of 5, and chroma of 2. Texture is fine sandy loam, sandy loam, or loam.

The Bt horizon has hue of 10YR or 2.5Y, value of 5, and chroma of 4 or 6; or hue of 10YR or 2.5YR, value of 6, and chroma of 4, or the horizon is mottled in shades of gray, brown, and yellow. Mottles that have chroma of 2 or less are within a depth of 16 inches. Texture is fine sandy loam, loam, sandy loam, or sandy clay loam. The Btx horizon has colors and textures that are similar to those of the Bt horizon, but the soils in the Btx horizon are compact and brittle in about 40 to 55 percent of the volume.

Sumter Series

The Sumter series consists of moderately deep, well drained, slowly permeable soils that formed in residuum of chalk. These gently sloping to moderately steep soils are on eroded ridgetops and side slopes in the Blackland Prairie. The native vegetation is prairie grasses that are intermingled with bois d'arc and eastern redcedar. Slopes are 3 to 20 percent.

Sumter soils are associated with Demopolis, Houston, and Oktibbeha soils. Demopolis soils are on the more dissected landscapes than Sumter soils. Demopolis soils have a loamy-skeletal control section and are less than 16 inches deep to chalk. Houston soils are in similar positions on the landscape. These soils have a very-fine control section, montmorillonitic mineralogy, and intersecting slickensides. Oktibbeha soils are in similar positions on the landscape, have a very fine control section, and are very slowly permeable.

Typical pedon of Sumter silty clay; 3 to 12 percent slopes, eroded, in a pasture area; SW1/4NW1/4SW1/4 sec. 10, T. 9 S., R. 22 W.

Ap—0 to 3 inches; olive gray (5Y 5/2) silty clay; moderate medium granular structure; friable, sticky and plastic; common fine and medium roots; about 10 percent, by volume, soft chalk fragments; moderately alkaline; calcareous; clear smooth boundary.

Bw1—3 to 14 inches; olive yellow (2.5Y 6/6) silty clay; common coarse distinct pale olive (5Y 6/3) mottles moderate medium subangular blocky structure; firm, sticky and plastic; common fine and medium roots; about 20 percent, by volume, soft chalk fragments; few fossils; moderately alkaline; calcareous; gradual smooth boundary.

Bw2—14 to 22 inches; pale olive (5Y 6/3) silty clay; common medium distinct olive yellow (2.5Y 6/6) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; common fine roots; about 25 percent, by volume, soft chalk fragments; few fossils; moderately alkaline; calcareous; gradual smooth boundary.

Bw3—22 to 31 inches; pale olive (5Y 6/3) silty clay, common medium distinct olive yellow (2.5Y 6/6) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; chalk fragments; few fossils; moderately alkaline; calcareous; abrupt irregular boundary.

Cr—31 to 33 inches; soft, rippable chalk; mottled in shades of brown, olive, and gray along cracks and seams; moderately alkaline; calcareous.

The thickness of the solum ranges from 20 to 40 inches. Reaction is mildly alkaline or moderately alkaline. The soils are calcareous throughout.

The A horizon has hue of 10YR or 5Y, value of 3 to 5, and chroma of 1 or 2; or hue of 2.5Y, value of 3 to 5, and chroma of 2.

The Bw horizon has hue of 5Y, value of 5 to 7, and chroma of 3, 4, or 6; or hue of 2.5Y, value of 5 to 7, and chroma of 4 or 6. Mottles in shades of yellow, olive, and brown range from few to common. Texture is silty clay loam, silty clay, or clay. Soft lime accumulations, hardened lime nodules, or soft chalk fragments range from few to many.

The Cr horizon is soft, platy chalk that has hue of 5Y, value of 5 to 7, and chroma of 1 to 3; or hue of 2.5Y, value of 5 to 7, and chroma of 2. This horizon is mottled in shades of yellow and brown along cracks and seams.

Terouge Series

The Terouge series consists of deep, somewhat poorly drained, very slowly permeable soils that formed in calcareous, clayey alluvium. These level to nearly level soils are on flood plains and low terraces in the Blackland Prairie. A perched high water table is at the surface or within a depth of 12 inches from December through April. The Terouge soils are rarely to occasionally flooded for brief periods from December through May. The native vegetation is mixed hardwoods. Slopes are 0 to 3 percent.

Terouge soils are associated with Tuscumbia and Una soils. Tuscumbia soils are in similar positions on the landscape as Terouge soils. Tuscumbia soils are poorly drained, have mixed mineralogy, and are not calcareous throughout. Una soils are in slightly lower positions on the landscape. They are poorly drained, have mixed mineralogy, and are noncalcareous.

Typical pedon of Terouge silty clay, 1 to 3 percent slopes, in a soybean field; NE1/4NE1/4SE1/4 sec. 6, T. 8 S., R. 19 W.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silty clay; common fine distinct olive brown mottles; strong medium granular structure; firm, sticky and plastic; common fine roots; few fine pores; slightly acid; clear smooth boundary.

A—7 to 22 inches; very dark grayish brown (10YR 3/2) silty clay; common fine distinct light olive brown mottles; moderate medium subangular blocky structure; firm, sticky and plastic; common fine roots; few fine pores; slightly acid; clear wavy boundary.

ACg1—22 to 34 inches; very dark grayish brown (10YR 3/2) clay; common fine distinct light olive brown mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few intersecting slickensides; few fine roots; few fine pores; slightly acid; gradual wavy boundary.

ACg2—34 to 41 inches; very dark grayish brown (10YR 3/2) clay; common medium distinct light olive brown (2.5Y 5/4) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; common intersecting slickensides; few fine roots; common fine carbonate concretions; moderately alkaline; calcareous; gradual wavy boundary.

Cg1—41 to 56 inches; very dark grayish brown (2.5Y 3/2) clay; common medium distinct very dark grayish brown (10YR 3/2) mottles; massive; very firm, sticky and plastic; common intersecting slickensides; few fine roots; few fine pores; common medium carbonate concretions; moderately alkaline; calcareous; gradual wavy boundary.

Cg2—56 to 72 inches; dark grayish brown (2.5Y 4/2) clay; common medium distinct dark grayish brown (10YR 4/2) mottles; massive; very firm, sticky and plastic; common intersecting slickensides; few fine roots; few fine pores; common medium carbonate concretions; moderately alkaline; calcareous.

Reaction is slightly acid or neutral in the A horizon and in the upper part of the AC horizon, and it ranges from neutral to moderately alkaline in the lower part of the AC horizon and in the C horizon. Carbonate concretions range from none to many.

The A horizon has hue of 10YR or 5Y, value of 2 or 3, and chroma of 2 or 3; or hue of 2.5YR, value of 2 or 3, and chroma of 2. Mottles in shades of olive and brown range from few to many. In undisturbed areas, the A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2; or hue of 2.5Y, value of 2 or 3, and chroma of 2. Mottles in shades of olive, brown, or red range from few to many.

The ACg and Cg horizons have hue of 10YR or 5Y, value of 3 or 4, and chroma of 1 or 2; or hue of 2.5Y, value of 3 or 4, and chroma of 2. Mottles in shades of olive and brown range from few to many.

The Terouge soils in this survey area were correlated as taxadjuncts to the Terouge series because reaction is slightly acid in the A horizon and the ACg1 horizon, and these horizons are noncalcareous. Also the depth to the C horizon is more than 40 inches. Use, management, and behavior of these soils are similar to those of the Terouge series.

Toine Series

The Toine series consists of deep, well drained, moderately permeable soils that formed in loamy alluvium. These level to nearly level soils are on flood plains and low terraces in the Ouachita Mountains and in the transitional areas to the Coastal Plain. These soils are occasionally flooded for brief periods from December to April. The native vegetation is mixed hardwoods and a few pines. Slopes are 0 to 2 percent.

Toine soils are associated with Avilla, Ceda, Kenn, Nugent, and Wing Variant soils. Avilla soils are on adjacent stream terraces, have a higher base saturation than the Toine soils, and have a yellowish red or red subsoil. Ceda soils are on more narrow flood plains than

Toine soils, have a loamy-skeletal control section, and do not have an argillic horizon. Kenn soils are in similar positions on the landscape as Toine soils, have siliceous mineralogy, and have more coarse fragments in the lower part of the subsoil. Nugent soils are on the inside bend of streams, have a sandy control section, and do not have have an argillic horizon. The Wing Variant soils are on terraces and uplands, are poorly drained, and have a natric horizon.

Typical pedon of Toine fine sandy loam, occasionally flooded, in a pasture; SE1/4SE1/4 sec. 5, T. 7 S., R. 20 W.

Ap—0 to 6 inches; dark brown (10YR 4/3) fine sandy loam; moderate medium granular structure, very friable; many fine and medium roots; medium acid; clear smooth boundary.

A—6 to 13 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak medium granular and weak coarse subangular blocky structure; friable; many fine and medium roots; strongly acid; clear smooth boundary.

Bt1—13 to 35 inches; dark yellowish brown (10YR 4/4) sandy clay loam; moderate medium subangular blocky structure; friable; common thick patchy clay film on faces of peds; common fine and medium roots; strongly acid; gradual smooth boundary.

Bt2—35 to 47 inches; yellowish brown (10YR 5/6) sandy clay loam; few fine distinct light brownish gray mottles; moderate medium subangular blocky structure; friable; common thick patchy clay film on faces of peds; common fine and medium roots; strongly acid; gradual smooth boundary.

Bt3—47 to 58 inches; yellowish brown (10YR 5/6) sandy clay loam; common fine distinct light brownish gray mottles; moderate medium subangular blocky structure; friable; common thick patchy clay film on faces of peds; few fine roots; 5 percent, by volume, rounded gravel; strongly acid; gradual wavy boundary.

BC—58 to 72 inches; yellowish brown (10YR 5/6) fine sandy loam; common fine distinct light brownish gray mottles, weak medium subangular blocky structure; friable; few thin patchy clay film on faces of peds; few fine roots; 10 percent, by volume, rounded gravel; strongly acid.

The thickness of the solum ranges from 45 to 72 inches or more. Reaction ranges from strongly acid to slightly acid in the A horizon, and it is strongly acid or very strongly acid in the B horizon. Coarse fragments of quartz, sandstone, and shale range from 0 to 15 percent throughout.

The A horizon has hue of 10YR, value of 4, and chroma of 2 to 4; or hue of 10YR, value of 5, and chroma of 3.

The Bt horizon has hue of 10YR, value of 4, and chroma of 4; or hue of 10YR, value of 5, and chroma of 4 or 6; or hue of 7.5YR, value of 4, and chroma of 4. Texture is sandy clay loam or loam. The BC horizon has colors that are similar to those of the Bt horizon. Texture is fine sandy loam, sandy clay loam, or loam. In some pedons, there are no gray mottles in the lower part of the Bt horizon or in the BC horizon. The mottles are not definitive for the series.

Trebloc Series

The Trebloc series consists of deep, poorly drained, slowly permeable soils that formed in loamy marine sediment. These level to nearly level soils are on upland flats in the transitional areas between the Coastal Plain and the Blackland Prairie. An apparent high water table is at a depth of 6 to 12 inches from January through April. The native vegetation is pines and mixed hardwoods. Slopes are 0 to 2 percent.

Trebloc soils are associated with Kipling and Savannah soils. Kipling soils are in slightly higher positions on the landscape than Trebloc soils. These soils have a clayey control section and are somewhat poorly drained. Savannah soils are in higher positions on the landscape, have a fine-loamy control section, are moderately well drained, and have a fragipan.

Typical pedon of Trebloc silt loam, 0 to 2 percent slopes, in a wooded area; NW1/4SE1/4NW sec. 7, T. 8 S., R. 19 W.

A—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium granular structure; very friable; common fine and few roots; very strongly acid; clear smooth boundary.

Btg1—6 to 21 inches; light brownish gray (10YR 6/2) silty clay loam; many coarse yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; common thin patchy clay film on faces of peds; common fine and medium roots; common iron-manganese concretions; very strongly acid; gradual smooth boundary.

Btg2—21 to 37 inches; light brownish gray (10YR 6/2) silty clay loam; many coarse yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; common thick patchy clay film on faces of peds; few fine and medium roots; common iron-manganese concretions; very strongly acid; gradual smooth boundary.

Btg3—37 to 61 inches; mottled gray (10YR 6/1) and yellowish brown (10YR 5/8) silty clay loam; moderate medium subangular blocky structure; firm; common thick patchy clay film on faces of peds; few fine and medium roots; common iron-manganese concretions; very strongly acid; gradual smooth boundary.

Btg4—61 to 72 inches; mottled gray (10YR 6/1) and yellowish brown (10YR 5/6) silty clay; moderate medium subangular blocky structure; firm, sticky and

plastic; common thick patchy clay film on faces of peds; few fine roots; common iron-manganese concretions; very strongly acid.

The thickness of the solum ranges from 60 to 80 inches or more. Reaction is strongly acid or very strongly acid throughout.

The A or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2; or hue of 10YR, value of 5, and chroma of 2. The E horizon, if present, has hue of 10YR, value of 5 or 6, and chroma of 1 or 2, or the horizon is mottled in shades of brown and gray. Texture is silt loam, loam, or very fine sandy loam.

The upper part of the B horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. Mottles in shades of brown and gray range from few to many. The lower part of the B horizon is mottled in shades of gray and brown. Texture is silt loam, silty clay loam, or silty clay.

Tuscumbia Series

The Tuscumbia series consists of deep, poorly drained, very slowly permeable soil that formed in clayey alluvium. These level soils are on flood plains in the Blackland Prairie. An apparent high water table is at a depth of 6 to 18 inches from December through April. These soils are occasionally flooded for brief periods in the winter and spring. The native vegetation is mixed hardwoods. Slopes are 0 to 1 percent.

Tuscumbia soils are associated with Leeper, Terouge, and Una soils. Leeper and Terouge soils are in slightly higher positions on the flood plain than Tuscumbia soils. These soils have montmorillonitic mineralogy and are somewhat poorly drained. Una soils are in similar positions on the landscape, but they are more acid throughout and do not have vertic properties.

Typical pedon of Tuscumbia silty clay, occasionally flooded, in a soybean field; SE1/4NW1/4NW1/4 sec. 8, T. 8 S., R. 19 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silty clay; strong medium granular structure; firm, sticky and plastic; common fine roots; few fine pores; many crayfish channels; neutral; clear smooth boundary.

Bg1—7 to 25 inches; dark gray (10YR 4/1) silty clay; moderate medium subangular blocky structure; firm, sticky and plastic; common fine roots; few fine pores; many crayfish channels; slightly acid; gradual wavy boundary.

Bg2—25 to 56 inches; gray (5Y 5/1) silty clay; few medium distinct light olive brown (2.5Y 5/4) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; common new intersecting slickensides; few fine roots; few fine pores; many crayfish channels; slightly acid; clear wavy boundary.

Bg3—56 to 68 inches; dark gray (5Y 4/1) silty clay; few medium distinct light olive brown (2.5Y 5/4) mottles; weak medium subangular blocky structure; firm, sticky and plastic; common intersecting slickensides; few fine roots; few fine pores; many crayfish channels; few calcium sulfate crystals; mildly alkaline; calcareous; gradual wavy boundary.

Bg4—68 to 72 inches; gray (5Y 5/1) clay; common medium distinct light olive brown (2.5Y 5/4) mottles; moderate medium subangular blocky structure; very firm, sticky and plastic; common intersection slickensides; few fine roots; few fine pores; many crayfish channels; moderately alkaline; calcareous.

The thickness of the solum is more than 50 inches. Reaction ranges from medium acid to moderately alkaline throughout. Black and brown concretions range from none to common throughout.

The A or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2; or hue of 10YR, value of 5, and chroma of 2 or 3; or hue of 2.5Y, value of 3 to 5 and chroma of 2.

The Bg horizon has hue of 10YR, value of 4 to 7, and chroma of 1; or hue of 10YR, value of 6 or 7, and chroma of 2; or hue of 2.5Y, value of 6 or 7, and chroma of 2; or hue of 5Y, value of 4 to 7, and chroma of 1. Mottles in shades of brown and yellow range from few to many. Texture is silty clay loam, silty clay, or clay.

Una Series

The Una series consists of deep, poorly drained, very slowly permeable soils that formed in clayey alluvium. These level soils are on flood plains in the Blackland Prairie. An apparent high water table is at a depth of 6 to 12 inches from November through April. The soils are flooded occasionally from January through March. The native vegetation is mixed hardwoods. Slopes are 0 to 1 percent.

Una soils are associated with Terouge and Tuscumbia soils. Terouge soils are in slightly higher positions on the landscape than Una soils. These soils have montmorillonitic mineralogy and are somewhat poorly drained. Tuscumbia soils are in similar positions on the landscape, but they are less acid and have vertic properties.

Typical pedon of Una silty clay loam, occasionally flooded, in a rice field; NE1/4NW1/4SE1/4 sec. 27, T. 8 S., R. 19 W.

Ap—0 to 6 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium granular structure; friable; many fine and medium roots; strongly acid; clear smooth boundary.

Bg1—6 to 16 inches; light brownish gray (10YR 6/2) silty clay; common coarse distinct yellowish brown (10YR 5/4) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; strongly acid; gradual smooth boundary.

Bg2—16 to 44 inches; gray (10YR 6/1) silty clay; common coarse distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; few nonintersecting slickensides; very strongly acid; gradual smooth boundary.

Bg3—44 to 72 inches; gray (10YR 6/1) silty clay; common medium distinct yellowish brown (10YR 5/4) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; few nonintersecting slickensides; very strongly acid.

The thickness of the solum is more than 60 inches. Reaction is strongly acid or very strongly acid throughout. In some pedons, it is medium acid to neutral below a depth of 40 inches.

The A horizon has hue of 10YR, value of 3 to 7, and chroma of 1; or hue of 10YR, 2.5Y, or 5Y, value of 5 or 7, and chroma of 2; or hue of 5Y, value of 4 to 7, and chroma of 1; or hue of 10YR, value of 6, and chroma of 3.

The Bg horizon has hue of 10YR, value of 4 to 7, and chroma of 1; or hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 2; or hue of 5Y, value of 5 to 7, and chroma of 1 or 2. Mottles in shades of brown and yellow range from few to common. Texture is silty clay loam, silty clay, or clay. Content of brown and black concretions ranges from few to common.

Urbo Series

The Urbo series consists of deep, somewhat poorly drained, very slowly permeable soils that formed in clayey alluvium. These level soils are on flood plains in the Blackland Prairie. An apparent high water table is at a depth of 12 to 24 inches from January through March. These soils are occasionally flooded from January through March. The native vegetation is mixed hardwoods. Slopes are 0 to 1 percent.

Urbo soils are associated with Leeper and Marietta soils. Leeper soils are on the upper reaches on the flood plain. They have montmorillonite mineralogy and are less acid than the Urbo soils. Marietta soils are closer to the stream channel. They have a fine-loamy control section and are moderately permeable.

Typical pedon of Urbo silty clay loam, occasionally flooded, in a soybean field; SE1/4NW1/4NW1/4 sec. 12, T. 9 S., R. 20 W.

Ap1—0 to 4 inches; dark brown (10YR 4/3) silty clay loam; weak medium subangular blocky structure; firm; common fine and medium roots; strongly acid; clear smooth boundary.

Ap2—4 to 7 inches; dark grayish brown (10YR 4/2) silty clay; common medium faint grayish brown (10YR 5/2) and few fine distinct yellowish brown mottles; weak medium subangular blocky structure; firm; common fine and medium roots; strongly acid; clear smooth boundary.

Bg1—7 to 15 inches; grayish brown (10YR 5/2) clay loam; common coarse distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; few fine roots; few iron-manganese concretions; very strongly acid; clear smooth boundary.

Bg2—15 to 45 inches; light brownish gray (10YR 6/2) clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; few iron-manganese concretions; very strongly acid; clear smooth boundary.

Bg3—45 to 58 inches; light brownish gray (10YR 6/2) clay; common medium distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; few iron-manganese concretions; pressure faces on some peds; very strongly acid; gradual smooth boundary.

Bg4—58 to 72 inches; light brownish gray (10YR 6/2) clay; common medium distinct yellowish brown (10YR 5/8) and few medium prominent yellowish red (5YR 5/8) mottles; weak coarse subangular blocky structure; very firm, sticky and plastic; common nonintersecting slickensides; few fine roots; few iron-manganese concretions; very strongly acid.

The thickness of the solum is more than 60 inches. Reaction is strongly acid or very strongly acid throughout.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2; or hue of 10YR, value of 4 or 5, and chroma of 3. Some pedons have a thin A horizon that has hue of 10YR, value of 3, and chroma of 1 or 2.

The Bg1 horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2; or hue of 10YR, value of 4, and chroma of 3 or 4; or hue of 10YR, value of 5, and chroma of 3; or hue of 2.5Y, value of 4, and chroma of 4. Mottles are in shades of gray, brown, or yellow. The Bg2, Bg3, and Bg4 horizons have hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 2; or hue of 10YR, value of 4 to 7, and chroma of 1. Texture of the B horizon is silty clay loam, clay loam, silty clay, or clay.

Wilcox Series

The Wilcox series consists of deep, somewhat poorly drained, slowly permeable soils that formed in clayey shale. These nearly level to gently sloping soils are on hilltops and side slopes in the Coastal Plain and in the transitional areas to the Blackland Prairie. A perched high water table is at a depth of 18 to 36 inches from January through April. The native vegetation is pines and mixed hardwoods. Slopes are 1 to 8 percent.

Wilcox soils are associated with Mayhew and Sacul soils. Mayhew soils are in slightly lower positions on the landscape than Wilcox soils, are poorly drained, and are very slowly permeable. Sacul soils are on a more dissected landscape, have a clayey control section, and are moderately well drained.

Typical pedon of Wilcox silt loam, 3 to 8 percent slopes; SE1/4NE1/4NW1/4 sec. 5, T. 10 S., R. 20 W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium granular structure; friable; common fine and medium roots; few iron-manganese concretions; strongly acid; clear smooth boundary.

Bt1—4 to 13 inches; yellowish red (5YR 5/8) clay; few fine prominent gray mottles; strong medium subangular blocky structure; very firm, sticky and plastic; thick patchy clay film on faces of peds; common fine and medium roots; few fine pores; few iron-manganese concretions; very strongly acid; clear smooth boundary.

Bt2—13 to 25 inches; mottled yellowish red (5YR 5/8), light brownish gray (10YR 6/2), and yellowish brown (10YR 5/4) clay; strong medium angular and subangular blocky structure; very firm, sticky and plastic, thick patchy clay film on faces of peds; few nonintersecting slickensides; few fine and medium roots; few fine pores; few iron-manganese concretions; very strongly acid, gradual smooth boundary.

Btg1—25 to 37 inches; gray (10YR 6/1) silty clay; common medium prominent yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; very firm, sticky and plastic; thick patchy clay film on faces of peds; few nonintersecting slickensides; few fine and medium roots; few fine pores; few iron-manganese concretions; very strongly acid; gradual smooth boundary.

Btg2—37 to 52 inches; light brownish gray (10YR 6/2) silty clay; common medium distinct yellowish brown (10YR 5/6) and few medium prominent yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; thick patchy clay film on faces of peds; few nonintersecting slickensides; few fine roots; few fine pores; few iron-manganese concretions; very strongly acid; clear wavy boundary.

Cg—52 to 62 inches; light brownish gray (10YR 6/2) silty clay; common medium distinct yellowish brown (10YR 5/6) mottles; massive; very firm, sticky and plastic; few pressure faces; few fine roots; few fine pores; few clay shale fragments; few iron-manganese concretions; very strongly acid; gradual wavy boundary.

Cr—62 to 72 inches; light brownish gray (10YR 6/2) clayey shale; very strongly acid.

The thickness of the solum ranges from 26 to 58 inches. The depth to clay shale ranges from 40 to 80 inches. Reaction ranges from strongly acid to extremely acid throughout.

The A horizon has hue of 10YR, value of 3, and chroma of 1 or 2; or hue of 10YR, value of 4, and chroma of 2 or 3.

The Bt horizon has hue of 2.5YR, value of 4 or 5, and chroma of 4; or hue of 5YR, value of 4, and chroma of 4 or 6; or hue of 5YR, value of 5, and chroma of 6 or 8; or hue of 7.5YR, value of 5, and chroma of 6 or 8. This horizon has mottles in shades of gray that range from few to many, or it is mottled in shades of brown, red, and gray. The lower part of the Bt horizon has a gray matrix. Texture is clay loam, silty clay loam, silty clay, or clay.

The Cg horizon has a gray matrix, or it is mottled in gray, brown, or red. Texture is silty clay or clay. The Cr horizon is soft, acid, clayey shale that can easily be cut with a spade.

Wing Variant

The Wing Variant consists of deep, somewhat poorly drained, very slowly permeable soils that formed in sediment underlain by shale. These level to nearly level soils are on stream terraces and upland flats in the Ouachita Mountains. An apparent high water table is at the surface or within a depth of 12 inches from December through March. The native vegetation is pines and mixed hardwoods. Slopes are 0 to 2 percent.

Wing Variant soils are associated with Bonnerdale, Pirum, and Toine soils. Bonnerdale soils are in similar positions on the landscape as Wing Variant soils. These soils have a coarse-loamy control section and do not have a natric horizon. Pirum soils are in slightly higher positions on the landscape, are well drained, and do not have a natric horizon. Toine soils are on flood plains and low terraces. They are well drained and do not have a natric horizon.

Typical pedon of Wing Variant fine sandy loam, 0 to 2 percent slopes; SW1/4NW1/4SW1/4 sec. 10, T. 5 S., R. 19 W.

Ap—0 to 3 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak medium granular structure; very friable; slightly acid; clear smooth boundary.

E—3 to 10 inches; yellowish brown (10YR 5/4) fine sandy loam; common medium distinct pale brown (10YR 6/3) and common fine distinct light brownish gray mottles; weak medium granular structure; very friable; neutral; clear wavy boundary.

Btg1—10 to 20 inches; light brownish gray (10YR 6/2) loam; common medium distinct yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; friable; mildly alkaline; clear wavy boundary.

Btg2—20 to 45 inches; mottled, light brownish gray (10YR 6/2) and yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; friable; moderately alkaline; abrupt irregular boundary.
2Cr—45 to 50 inches; weakly cemented, tilted and fractured, mildly alkaline shale.

The thickness of the solum and the depth to shale bedrock range from 40 to 60 inches or more. Exchangeable sodium is more than 15 percent within a depth of 7 to 16 inches of the upper part of the B horizon. Reaction ranges from very strongly acid to neutral in the A and E horizons and from medium acid to moderately alkaline in the B and C horizons. Coarse fragments of shale and sandstone range from 0 to 10 percent, by volume.

The A or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. Mottles are in shades of yellow and brown.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 2 to 4. Mottles in shades of gray and brown are common. Texture is fine sandy loam or loam.

The Btg horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. This horizon has mottles in shades of yellow and brown, or it is mottled in shades of gray, brown, and yellow. Texture is silty clay loam, loam, or clay loam in the upper part of the horizon and is silty clay loam, loam, clay loam, and silty clay in the lower part.

The 2Cr horizon is tilted and fractured, soft, alkaline shale.

Yanush Series

The Yanush series consists of deep, well drained, moderately permeable soils that formed in residuum and colluvium of chert and novaculite. These nearly level to steep soils are on side slopes and ridgetops of the Ouachita Mountains. The native vegetation is pines and mixed hardwoods. Slopes are 1 to 40 percent.

Yanush soils are associated with Bigfork, Carnasaw, and Ceda soils. Bigfork soils are on higher and narrower ridgetops than Yanush soils. These soils have a lower base saturation and are less than 50 inches deep to bedrock. Carnasaw soils are on lower side slopes and in valleys. They have a clayey control section and are underlain by shale bedrock that has lenses of sandstone. Ceda soils are on flood plains. They do not have an argillic horizon and are rapidly permeable.

Typical pedon of Yanush very cherty silt loam, in a forest area of Yanush-Bigfork-Carnasaw complex, 20 to 40 percent slopes; SE1/4SW1/4NE1/4 sec. 26, T. 4 S., R. 21 W.

A—0 to 5 inches; dark brown (10YR 4/3) very cherty silt loam; moderate medium granular structure; friable; common fine and medium roots; about 35 percent, by volume, chert fragments; medium acid; clear smooth boundary.
E—5 to 15 inches; strong brown (7.5YR 5/6) very cherty silt loam; weak to moderate medium subangular blocky structure; friable; common fine and medium roots; about 35 percent, by volume, chert fragments; strongly acid; clear smooth boundary.
Bt1—15 to 34 inches; red (2.5YR 5/6) very cherty silty clay loam; weak medium subangular blocky structure; firm; few fine and medium roots; thick patchy clay film on faces of peds; about 45 percent, by volume, chert fragments; very strongly acid; gradual smooth boundary.
Bt2—34 to 51 inches; red (2.5YR 4/6) extremely cherty silty clay loam; weak medium subangular blocky structure; firm; few fine and medium roots; thick patchy clay film on faces of peds; about 65 percent, by volume, chert fragments; very strongly acid; gradual smooth boundary.
Bt3—51 to 65 inches; red (2.5YR 4/6) extremely cherty silty clay loam; weak medium subangular blocky structure; firm; few fine and medium roots; thick patchy clay film on faces of peds; about 75 percent, by volume, chert fragments, very strongly acid; abrupt irregular boundary.
R—65 to 72 inches; chert and novaculite; massive; discontinuous and intermingled with tilted and fractured shale and siltstone.

The thickness of the solum is more than 60 inches. Reaction is slightly acid or medium acid in the A horizon. It ranges from medium acid to very strongly acid in the E horizon and from medium acid to very strongly acid in the B horizon.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4; or hue of 7.5YR, value of 3 to 5, and chroma of 2 or 4. Coarse fragments of chert and novaculite range from 35 to 60 percent, by volume.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 2, 3, 4, or 6; or hue of 10YR, value of 5 or 6, and chroma of 8; or hue of 7.5YR, value of 5 or 6, and chroma of 2, 4, 6, or 8; or hue of 10YR, value of 4, and chroma of 2, 4, or 6. Texture is very cherty silt loam or very cherty loam. Coarse fragments of chert and novaculite range from 35 to 60 percent, by volume.

The Bt horizon has hue of 2.5YR, value of 3 to 5, and chroma of 4 or 6; or hue of 2.5YR, value of 4 or 5, and chroma of 8; or hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6; or hue of 5YR or 7.5YR, value of 3, and chroma of 4; or hue of 5YR or 7.5YR, value of 5, and chroma of 8. Texture is very cherty clay loam, very cherty silty clay loam, or their extremely cherty analogs. Coarse fragments of chert and novaculite range from 35 to 90 percent, by volume.

Zafra Series

The Zafra series consists of moderately deep to deep, well drained, moderately permeable soils that formed in residuum of sandstone interbedded with lenses of shale. These gently sloping to steep soils are on side slopes and ridgetops of the Ouachita Mountains. The native vegetation is pines and mixed hardwoods. Slopes are 3 to 40 percent.

Zafra soils are associated with Bismarck, Carnasaw, Clebit, and Sherwood soils. Bismarck and Carnasaw soils are on the lower side slopes and in the valleys. Bismarck soils do not have an argillic horizon and are less than 20 inches deep to soft shale bedrock. Carnasaw soils have a clayey control section and are less than 60 inches deep to soft shale bedrock. Clebit soils are in similar positions on the landscape as Zafra soils, but they do not have an argillic horizon and are less than 20 inches deep to hard sandstone bedrock. Sherwood soils are on a less dissected landscape and have a fine-loamy control section.

Typical pedon of Zafra stony fine sandy loam, in a forest area of Zafra-Carnasaw-Clebit complex, 20 to 40 percent slopes; SW1/4SW1/4NE1/4 sec. 20, T. 6 S., R. 20 W.

A—0 to 5 inches; dark grayish brown (10YR 4/2) stony fine sandy loam; moderate medium granular structure; friable; many fine and medium roots; 30 percent, by volume, fragments of sandstone up to 30 inches across; strongly acid; clear smooth boundary.

E—5 to 9 inches; yellowish brown (10YR 5/4) very gravelly fine sandy loam; weak medium granular structure; friable; many fine and medium roots; 35 percent, by volume, fragments of sandstone less than 3 inches across; strongly acid; clear smooth boundary.

BE—9 to 12 inches; yellowish brown (10YR 5/8) very gravelly loam; weak medium subangular blocky structure; friable; few fine and medium roots; 35 percent, by volume, fragments of sandstone less than 3 inches across; very strongly acid; clear smooth boundary.

Bt—12 to 31 inches; yellowish red (5YR 5/8) very gravelly sandy clay loam; moderate medium subangular blocky structure; friable; few fine and medium roots; thick patchy clay film on faces of peds; 40 percent, by volume, fragments of sandstone less than 3 inches across; very strongly acid; abrupt irregular boundary.

Cr—31 to 33 inches; tilted and fractured, soft sandstone that has lenses of shale.

R—33 to 35 inches; tilted and fractured, hard sandstone bedrock that has lenses of shale.

The thickness of the solum ranges from 20 to 56 inches. The depth to bedrock ranges from 25 to 60 inches. Reaction is medium acid or strongly acid in the A and E horizons, and it is very strongly acid in the BE, B, and BC horizons.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. Coarse fragments that are more than 3 inches across make up 15 to 35 percent of the volume, and those that are less than 3 inches across make up 5 to 35 percent of the volume.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. Texture is fine sandy loam or loam, or their gravelly or very gravelly analogs. Coarse fragments that are less than 3 inches across range from 15 to 35 percent, by volume.

The BE horizon has hue of 10YR, value of 5, and chroma of 4, 6, or 8; or hue of 7.5YR, value of 5, and chroma of 6 or 8. Texture is gravelly or very gravelly loam. Coarse fragments that are more than 3 inches across make up 0 to 2 percent of the volume, and those that are less than 3 inches across make up 15 to 35 percent of the volume. The Bt horizon has hue of 7.5YR, value of 4, and chroma of 4; or hue of 7.5YR, value of 5, and chroma of 6 or 8; or hue of 2.5YR, value of 4 or 5, and chroma of 6 or 8. Texture is very gravelly loam, very gravelly clay loam, or very gravelly sandy clay loam. Coarse fragments that are more than 3 inches across make up 0 to 5 percent of the volume, and those that are less than 3 inches across make up 35 to 60 percent of the volume.

The Cr horizon is soft sandstone that has lenses of shale and hard sandstone. Colors are in shades of red, brown, and yellow.

The R horizon is hard sandstone that has lenses of shale and soft sandstone. The shale and limestone are tilted at 20 to 60 degrees from the horizontal.

Formation of the Soils

In this section, the factors of soil formation are discussed and related to the soils in the survey area. In addition, the processes of horizon differentiation are described.

Factors of Soil Formation

Soil is the collection of three-dimensional natural bodies on the earth's surface. Soil supports plants and has properties resulting from the integrated effect of climate and living matter acting on parent material, as conditioned by relief, over time *(6)*.

The interaction of five main factors results in differences between soils. These factors are the physical and chemical composition of the parent material, the climate during and after the accumulation of the parent material, the kinds of plants and organisms living in the soils, the relief of the land and its effect on runoff, and the length of time it took the soil to form.

The influence of any factor can vary from place to place, but the interaction of all factors determines the kind of soil that forms. In the following paragraphs the factors of soil formation are discussed as they relate to the soils in Clark and Hot Spring Counties.

Parent Material

The soils of Clark and Hot Spring Counties formed in many different types of geologic materials. They range in age from the Ordovician Period of the Palezoic Era to the Quaternary Period of the Cenozoic Era *(3)* and *(5)*.

The northwestern parts of Clark and Hot Spring Counties are in the Ouachita Mountains. The formations that made up these mountains are of the Ordovician through Pennsylvanian Periods. The formations are mainly interbedded shale and sandstone that have some intermingled chert and novaculite. The shale formations in this area are the Johns Valley, Stanley, Missouri Mountain, Polk Creek, Womble, Mazard, and Collier formations. These shales are generally acid, are highly fractured, and are dipping from 20 degrees to as much as 90 degrees from the horizontal. Bismarck and Carnasaw soils developed from these shales.

The sandstone formations of the Ouachita Mountains are the Jackfork, Blaylock, and Blakely formations. These sandstones vary from fine grain to coarse grain, are typically acid, are highly fractured, and are dipping from 20 degrees to as much as 90 degrees from the horizontal (fig. 18). Sherless, Shermore, Sherwood, Clebit, Zafra, and Pirum soils developed from these sandstone formations.

The chert and novaculite formations of the Ouachita Mountains consist of Bigfork Chert of the Ordovician Period and Arkansas Novaculite of the Devonian and Mississippian Periods. Bigfork and Yanush soils developed from these formations.

The Ouachita Mountains geologic formations in Hot Spring County also include igneous rocks of the Cretaceous Period of the Mesozoic Era. This is a very unique area and is actually a three-ring dike complex. This unique area is located at Magnet Cove. Magnet soils developed from these igneous rocks.

The Blackland Prairie is scattered throughout the southern part of Clark County. A very small remnant also is in Hot Spring County. These formations are of the Cretaceous Period of the Mesozoic Era. The dominant formations are the Tokio Formation, Woodbine Formation, Arkadelphia Marl, Annona Chalk, Nactoach Sand, Saratoga Chalk, Marlbrook Marl, Ozan Formation, and Brownstown Marl. These marl or chalk formations contain many fossils. Demopolis, Houston, and Sumter soils formed from these formations. Some of the soils of the Blackland Prairie formed from a combination of marl or chalk and a thin mantle of Pleistocene sediments. Oktibbeha, Eutaw, Kipling, and Macon soils formed in these areas.

The Coastal Plain is in the southern parts of Clark and Hot Spring Counties. The Coastal Plain formations are of the Tertiary Period of the Cenozoic Era. The Jackson Group, the Claiborne Group, and the Wilcox Group are the main formations. Sacul, Saffell, and Smithdale soils formed in residuum from these formations.

Bottom lands and stream terraces are scattered throughout all parts of Clark and Hot Spring Counties. These are the youngest geologic formations in the counties. The bottom lands and stream terraces are of the Quaternary Period of the Cenozoic Era. The bottom lands are mainly Holocene Epoch aged material, and the stream terraces are Pleistocene Epoch aged material. The main soils are Ouachita and Sardis soils on the flood plains and Gurdon and Stough soils on the adjacent terraces. Bottom land soils of the Blackland Prairie include the Urbo, Terouge, and Marietta soils. The main bottom land soils of the Ouachita Mountains are the Toine and Ceda soils.

Figure 18.—Fractured and tilted sandstone bedrock such as this exposed in roadcut.

Climate

The climate of Clark and Hot Spring Counties is characterized by relatively short, cool winters and long, hot summers with adequate rainfall. The present climate probably is similar to the climate under which the soils in the counties formed. The average daily maximum temperature is about 92 degrees during the summer and about 56 degrees F during the winter. The average annual rainfall is about 52 inches and generally is well distributed throughout the year. For additional information about the climate of Clark and Hot Spring Counties, refer to the section "General Nature of the Survey Area."

The warm, moist climate in the survey area promotes rapid soil formation and encourages rapid chemical reaction. The large amount of water that moves through the soil is instrumental in moving dissolved or suspended materials downward in the soil profile. Plant remains decompose rapidly, and the organic acid that forms hastens the removal of carbonates and the formation of clay. Because the soil is frozen only to a shallow depth and for a relatively short period, soil development continues almost the year round. The climate throughout the counties is relatively uniform. Its effect is modified locally by elevation and slope aspect. Climate alone does not account for the differences in the soils in the survey area.

Living Organisms

Plants and animals, including insects, bacteria, and fungi, are important in the formation of the soils. Among the changes they cause are gains in organic matter and nitrogen in the soil, gains or losses in plant nutrients, and changes in structure and porosity.

Before Clark and Hot Spring Counties were settled, the native vegetation had more influence on soil formation than did biological activity. The survey area was covered with forests of mixed stands of loblolly pines and hardwoods in the Coastal Plain, mixed shortleaf pines and hardwoods in the Ouachita Mountains, and prairie grasses mixed with a few hardwoods in the Blackland Prairie. The bottom lands in all parts of these counties were covered mainly with forests of mixed hardwoods.

Scattered across the northern parts of Clark and Hot Spring Counties in the Ouachita Mountains on the

uplands are some shallow soils that are underlain by sandstone, shale, chert, or novaculite. These soils supported savannas. The vegetation of these savannas was eastern redcedar or mixed eastern redcedar and hardwoods. Grasses grew tall in openings between the trees. Clebit soils are dominant in the shallow sandstone areas, Bismarck soils are dominant in the shallow shale areas, and Bigfork soils are dominant in the shallow chert and novaculite areas. The surface layer of these soils have been darkened by the accumulation of organic matter.

In the Ouachita Mountains, the native vegetation on most of the gently sloping to very steep, dissected uplands was mixed shortleaf pines and hardwoods. The soils in these areas have a slight accumulation of organic matter and are dark colored only in the upper few inches. The Carnasaw and Sherwood series are typical soils that formed in this area.

In the Coastal Plain, the native vegetation on most of the gently sloping to moderately steep, dissected uplands was mixed loblolly pines and hardwoods. The soils in these areas have a slight accumulation of organic matter and are dark colored only in the upper few inches. The Sacul and Ruston series are typical soils that formed in this area.

In the Blackland Prairie, the native vegetation on most of the gently sloping to moderately steep, dissected uplands are mainly mixed prairie grasses and mixed hardwoods. The soils in these areas have a significant accumulation of organic matter and some are dark colored to a depth of 2 feet or more. The Houston and Sumter series are typical soils that formed in this area.

In the bottom lands, the native vegetation throughout Clark and Hot Spring Counties are mainly mixed hardwoods and a few pines. The soils in these areas have a slight accumulation of organic matter and are dark colored in the upper few inches. The bottom lands in the Blackland Prairie are an exception. Typically, they have a very significant accumulation of organic matter, and some are dark colored to a depth of 3 feet or more.

Variations in native vegetation in the county are related partly to variations in the available water capacity and in the surface and internal drainage of the soils. A significant factor in the type of native vegetation is the reaction of the soil. In the Blackland Prairie, the alkaline reaction is unfavorable for pines and most hardwoods; however, it is very favorable for the growth of bois d'arc, eastern redcedar, and prairie grasses. Soils that have a high content of sodium, such as Foley soils, typically, have stunted tree growth and stunted prairie grass growth. Generally, the plant species and plant response is an excellent indicator of the type of the soil.

Only the major differences in the original vegetation are reflected to any extent in the characteristics of the soils.

Man is an important factor in the future rate and direction of soil formation. He clears the forest, cultivates the land, and introduces new kinds of plants. He applies fertilizer, organic residue, lime, and chemicals to the soil for insect, disease, and weed control. He builds dams for flood control, he cuts, fills, grades, and compacts the soil surface, and he covers the surface with structures and pavement. Some results of these actions will not become known for many centuries. Nevertheless, the way that living organisms affect soil formation in these counties has been drastically changed by man.

Relief

The relief in Clark and Hot Spring Counties varies greatly. In the Ouachita Mountains, relief primarily is the result of repeated uplifts and downthrows of Paleozoic rocks and the subsequent geologic erosion and entrenchment of streams and drainage channels into the land surface. In the Coastal Plain and Blackland Prairie, relief primarily is the result of geologic erosion and entrenchment of streams and drainage channels into land surface.

The highest point in the survey area, which is about 1,280 feet above sea level, is at the lookout tower, which is north of Bismarck in Hot Spring County. The lowest point is about 120 feet above sea level, and at this point, the Ouachita River leaves Clark County south of Vaden.

Some of the greatest differences in the soils of Clark and Hot Spring Counties are caused by differences in relief through its effect on drainage, runoff, erosion, and percolation of water through the soil. Relief ranges from level flood plains to nearly vertical escarpments.

Some soils on the steeper slopes, narrow ridges, and hilltops are shallow because they have lost so much material through geologic erosion, such as Clebit and Bismarck soils. In other areas of strong relief, soils formed in cherty material. These soils, such as the Yanush soils, contain large quantities of chert from weathered chert and novaculite formations. The chert mantle retards geologic erosion. In contrast, soils that are on gently sloping uplands, such as Sherwood and Sherless soils, have lost little soil material.

Ceda and Kenn soils that are on nearly level flood plains and low terraces formed in deep, loamy and cherty material that washed from uplands and was deposited on stream flood plains. Progressive stream entrenchment has left the Kenn soils in slightly higher positions than the Ceda soils.

The soils on the flood plains along streams in the survey area are level to nearly level and are subject to flooding unless they are protected by upstream flood-retarding structures. Typical soils on the flood plains include Ouachita, Guyton, Sardis, Ochlockonee, Nugent, and Toine soils. These soils formed in deep silty, loamy, or sandy alluvium.

Time

The length of time required for soils to form depends largely on other factors of soil formation. Generally, less time is required if the climate is warm and humid and the vegetation luxuriant. If other factors are equal, less time is required if the parent material is loamy than if the parent material is clayey.

In terms of geologic time, most of the soils in Clark and Hot Spring Counties are old regardless of whether they are on mountaintops, hillsides, or stream terraces. The young soils formed either in alluvium along streams or in residuum where geologic erosion has nearly kept pace with weathering of the bedrock.

The soils on uplands in the Ouachita Mountains formed in material that weathered from rocks of the Ordovician or Pennsylvanian Period. The igneous rocks of Magnet Cove area are of the Cretaceous Period. Most of these soils are old. Most of the cations have been leached out, and the reaction is strongly acid or very strongly acid. There has been considerable weathering and translocation of clay, and the horizons are clearly expressed. Because iron, as well as clay, has been translocated from the A horizon to the B horizon and then oxidized, the B horizon has stronger red, brown, and yellow colors than the A horizon. In addition, some organic matter has accumulated in the A horizon, and this has resulted in dark colors in the horizon. Sherwood and Carnasaw soils are typical of the Ouachita Mountains soils and clearly show the effect of time acting with other soil-forming factors on parent material.

Soils on uplands in the Blackland Prairie formed in material that weathered from chalk and marl of the Cretaceous Period. These soils are old; however, they are younger than the Ouachita Mountain soils with the exception of the igneous rocks in the Ouachita Mountains. These Blackland Prairie soils were originally very high in cations, and although they have been subject to leaching, they are still fairly high in cations. The reaction is generally slightly acid to mildly alkaline. Most horizons are weakly expressed. Because some iron, as well as clay, has been translocated from the A horizon to the B horizon and then oxidized, the B horizon has somewhat stronger colors of red, brown, and yellow than the A horizon. Some organic matter has accumulated in the A horizon and, to a minor extent, in the B horizon and has resulted in the darker colors in these horizons. Houston and Oktibbeha soils are typical of the Blackland Prairie soils and clearly show the effect of time acting with other soil-forming factors on parent material.

The soils on uplands in the Coastal Plain weathered from sediment of the Tertiary Period. These are the youngest upland soils in Clark and Hot Spring Counties. The sediments from which these soils were formed were not high in cations. Most of the cations have been leached out. The reaction is strongly acid or very strongly acid. There has been considerable weathering and translocation of clay, and the horizons are clearly expressed. Because iron, as well as clay, has been translocated from the A horizon to the B horizon and then oxidized, the B horizon has stronger red, brown, and yellow colors than the A horizon. In addition, some organic matter has accumulated in the A horizon and has resulted in dark colors.

The youngest soils in Clark and Hot Spring Counties are on flood plains in the Ouachita Mountains, the Blackland Prairie, and the Coastal Plain. These soils formed in recent alluvium on the flood plains of the major streams. No definite horizons have formed below the A horizon; instead, these soils still have depositional bedding planes. They have no soil structure other than in the A horizon. Base saturation is generally higher in these soils than in the surrounding upland soils with the exception of the Blackland Prairie upland soils. The organic matter generally decreases irregularly with depth. Nugent and Ochlockonee soils are typical of the young soils that are on the flood plains.

In Clark and Hot Spring Counties, former flood plains that are now terraces have soils that are slightly older than the present flood plain soils. These soils formed in material deposited during the Pleistocene Epoch of the Quaternary Era. Sufficient leaching of cations and translocation of clay has taken place for these soils to have developed horizons; however, the degree of development is not as strong as in the adjacent upland soils. Typical terrace soils include Avilla soils in the Ouachita Mountains and Gurdon soils in the Coastal Plain.

Processes of Horizon Differentiation

The effects of the soil-forming factors are reflected in the soil profile, which is a succession of layers, or horizons, from the surface downward and includes at least the upper part of the parent material. The parent material has been little altered by soil-forming processes. The horizons differ in one or more properties, such as color, texture, structure, consistence, porosity, or reaction.

Most soil profiles in Clark and Hot Spring Counties contain three to five master horizons or layers. The master layers or horizons are designated A, E, B, C, and R. Young soils generally do not have E and B horizons.

The horizon of maximum accumulation of humified organic matter is called the A horizon or the surface layer. The horizon of maximum leaching of dissolved or suspended materials is called the E horizon or the subsurface layer.

The B horizon lies immediately below the E horizon and is called the subsoil *(12)*. The B horizon is the horizon of maximum accumulation of dissolved or suspended materials, such as iron and silicate clay. Generally, this horizon has blocky structure and is firmer than the horizons immediately above or below it.

The C horizon lies below the B horizon. Typically, it has been little affected by the soil-forming processes, but in some places it is materially modified by weathering. In some young soils, the C horizon has been only slightly modified by living organisms and by weathering. It is immediately below the A horizon.

The R layer generally lies below the C horizon, but it may lie immediately below an A horizon or a B horizon. It is bedrock that is sufficiently coherent when moist to make hand digging with a spade impractical.

In Clark and Hot Spring Counties, several processes have been active in the formation of soil horizons. Among these processes are the accumulation of organic matter, the leaching of carbonates and bases, the oxidation or reduction and transfer of iron, and the formation and translocation of silicate clay minerals. In most of the soils, more than one of these processes were involved.

The physical weathering of rocks through heating and cooling and wetting and drying slowly breaks them into small pieces that form the parent material for the residual soils. This is most evident in the Zafra soils.

The accumulation of organic matter in the upper part of the profile (A horizon) is readily evident in the undisturbed areas of the Sherwood series. These soils have a light-colored subsurface layer from which organic matter, clay, and iron oxides have been removed.

Leaching of carbonates and bases has occurred in nearly all of the soils in Clark and Hot Spring Counties. Generally, bases are leached downward in soils before silicate clay minerals begin to move. Most of the upland soils in the survey area have been strongly leached with the exception of the upland Blackland Prairie soils.

Oxidation of iron is evident in moderately well drained and well drained soils, for example, in Sherwood, Sacul and Smithdale soils on uplands and Avilla soils on terraces. A red or brown B horizon is an indication of the oxidation of iron.

The translocation of silicate clay minerals has contributed to horizon development in most of the soils in Clark and Hot Spring Counties. In areas where the soils are or have been cultivated, most of the eluviated E horizon has been destroyed. Where it remains, the E horizon has weak granular to blocky or platy structure, has less clay than the lower horizons, and is lighter colored than the rest of the soil. Clay films generally have accumulated in pores and on faces of peds in the B horizon. Most of the soils were probably leached of carbonates and soluble salts before the translocation of silicate clay occurred.

In Clark and Hot Spring Counties, leaching of bases and translocation of silicate clay are among important processes of horizon differentiation in the soils.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well-aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

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. A soil that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a fragment.

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 film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Compressible (in tables). The volume of soft soil decreases excessively under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazingland 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 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 periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.
Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

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.

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 the activities of man or other animals or of a catastrophe in nature, such as fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay are in the soil. The soil is not a source of gravel or sand for construction purposes.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grains are grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake (in tables). The movement of water into the soil is rapid.

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.

Fine textured soil. Sandy clay, silty clay, and clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Foot slope. The inclined surface at the base of a hill.

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 and mottles.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 centimeters) in diameter.

Ground water (geology). Water filling all the unblocked pores of underlying 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.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

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 upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:
O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.
A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material.

Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is, in part, a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as accumulation of clay, sesquioxides, humus, or a combination of these; prismatic or blocky structure; redder or browner colors than those in the A horizon; or a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Arabic numeral 2 precedes the letter C.

R layer.—Consolidated rock (unweathered bedrock) beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

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. This contrasts with percolation, which is movement of water through soil layers or material.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake in inches per hour is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Large stones (in tables). Rock fragments that are 3 inches (7.5 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.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

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. Sandy loam and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

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.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Subsurface tunnels or pipelike cavities are formed by water moving through the soil.

Pitting (in tables). Pits are caused by melting ground ice. They form on the soil after plant cover is removed.

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.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can

be removed only by percolation or evapotranspiration.

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 filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of the 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 degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. Rippable bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 draw bar horsepower rating.

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). There is a 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-size particles.

Saprolite (soil science). Unconsolidated, residual material underlying the soil and grading to hard bedrock below.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

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. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

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.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil is generally silty or clayey, is slippery when wet, and is low in productivity.

Slippage (in tables). The soil mass is 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.

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 (7.5 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
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 underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

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 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.

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in organic matter content than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed on the contour or at a slight angle to the contour across sloping soils. The terrace intercepts surface runoff, so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). An otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Unstable fill (in tables). There is a risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

Weathering. All physical and chemical changes produced by atmospheric agents in rocks or other deposits at or near the earth's surface. These changes result in disintegration and decomposition of the material.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--NUMBER OF LIVESTOCK ON FARMS
IN 1982

County	All Cattle and Calves	Milk Cows	Hogs and Pigs*
Clark	26,200	500	1,200
Hot Spring	23,700	1,200	1,300

* December 1, 1981

TABLE 2.--HARVESTED ACREAGES OF PRINCIPAL CROPS
IN 1981

County	Soybeans	Rice	Wheat
Clark	30,700	3,800	5,300
Hot Spring	5,900	1,300	1,000

TABLE 3.--TEMPERATURE AND PRECIPITATION

[Based on data recorded in the period 1951-80 at Arkadelphia, Arkansas]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have--		Average number of growing degree days*	Average	2 years in 10 will have--		Average number of days with 0.10 inch or more	Average snowfall
				Maximum temperature higher than--	Minimum temperature lower than--			Less than--	More than--		
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	52.8	31.1	42.0	77	8	51	3.99	1.93	5.76	7	1.2
February---	58.5	34.3	46.4	79	14	73	3.68	2.00	5.15	6	.7
March------	66.5	41.1	53.8	87	21	205	4.95	2.83	6.83	7	.2
April------	76.3	50.6	63.5	89	29	405	5.62	2.49	8.28	7	.0
May--------	82.6	58.6	70.6	93	41	639	5.68	2.77	8.20	7	.0
June-------	89.3	66.1	77.7	100	51	831	4.23	1.63	6.44	6	.0
July-------	93.1	69.9	81.5	103	58	977	3.87	2.05	5.45	6	.0
August-----	93.2	68.5	80.9	103	56	958	2.68	.90	4.15	4	.0
September--	86.8	62.4	74.6	100	44	738	4.54	1.81	6.83	6	.0
October----	77.3	49.9	63.6	92	30	426	3.37	.89	5.35	4	.0
November---	64.1	39.8	52.0	83	20	133	4.81	2.29	6.97	6	.1
December---	55.5	33.5	44.5	76	12	36	4.37	2.40	6.10	6	.5
Yearly:											
Average--	74.7	50.5	62.6	---	---	---	---	---	---	---	---
Extreme--	---	---	---	105	6	---	---	---	---	---	---
Total----	---	---	---	---	---	5,472	51.79	43.00	60.15	72	2.7

* 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 °F).

TABLE 4.--FREEZE DATES IN SPRING AND FALL

[Based on data recorded in the period 1951-80 at Arkadelphia, Arkansas]

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--	March 24	April 1	April 15
2 years in 10 later than--	March 16	March 25	April 10
5 years in 10 later than--	February 27	March 13	April 1
First freezing temperature in fall:			
1 year in 10 earlier than--	November 6	October 28	October 17
2 years in 10 earlier than--	November 13	November 3	October 22
5 years in 10 earlier than--	November 25	November 13	October 31

TABLE 5.--GROWING SEASON

[Based on data recorded in the period 1951-80 at Arkadelphia, Arkansas]

Probability	Length of growing season if daily minimum temperature is ---		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	240	219	192
8 years in 10	250	228	199
5 years in 10	270	244	212
2 years in 10	290	261	225
1 year in 10	301	270	232

TABLE 6.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Clark County	Hot Spring County	Total--	
				Area	Extent
		Acres	Acres	Acres	Pct
1	Adaton silt loam, 0 to 1 percent slopes	4,425	1,500	5,925	0.6
2	Amy silt loam, 0 to 2 percent slopes	9,720	6,655	16,375	1.7
3	Avilla fine sandy loam, 3 to 8 percent slopes	645	120	765	0.1
4	Bigfork-Rock outcrop complex, 3 to 8 percent slopes	810	8,635	9,445	1.0
5	Bigfork-Rock outcrop complex, 40 to 60 percent slopes	515	9,100	9,615	1.0
6	Bismarck very shaly loam, 3 to 12 percent slopes	745	3,520	4,265	0.4
7	Bismarck very shaly loam, 12 to 20 percent slopes	30	1,605	1,635	0.2
8	Bonnerdale fine sandy loam, 0 to 5 percent slopes	16,785	12,295	29,080	3.0
9	Bowie fine sandy loam, 1 to 3 percent slopes	2,435	3,860	6,295	0.7
10	Bowie fine sandy loam, 3 to 8 percent slopes	2,860	4,285	7,145	0.7
11	Cahaba fine sandy loam, 1 to 3 percent slopes	2,240	2,385	4,625	0.5
12	Cahaba fine sandy loam, 3 to 6 percent slopes	495	75	570	0.1
13	Carnasaw-Bismarck-Sherless complex, 3 to 8 percent slopes	2,960	5,375	8,335	0.9
14	Carnasaw-Bismarck-Zafra complex, 8 to 20 percent slopes	17,455	36,976	54,431	5.7
15	Carnasaw-Bismarck-Zafra complex, 20 to 40 percent slopes	125	2,915	3,040	0.3
16	Ceda gravelly fine sandy loam, occasionally flooded	2,450	3,410	5,860	0.6
17	Cuthbert fine sandy loam, 20 to 40 percent slopes	2,295	0	2,295	0.2
18	Darden loamy fine sand, 5 to 12 percent slopes	0	940	940	0.1
19	Demopolis very channery silty clay loam, 3 to 12 percent slopes, severely eroded	385	0	385	*
20	Eutaw silty clay loam, 0 to 2 percent slopes	1,425	0	1,425	0.1
21	Foley silt loam, 0 to 2 percent slopes	1,390	620	2,010	0.2
22	Gurdon silt loam, 1 to 3 percent slopes	10,675	2,225	12,900	1.3
23	Gurdon silt loam, occasionally flooded	21,520	8,455	29,975	3.1
24	Guyton silt loam, occasionally flooded	19,775	1,465	21,240	2.2
25	Guyton silt loam, ponded	2,545	695	3,240	0.3
26	Harleston fine sandy loam, 1 to 3 percent slopes	3,940	8,130	12,070	1.3
27	Houston clay, 1 to 3 percent slopes	1,060	0	1,060	0.1
28	Houston clay, 3 to 8 percent slopes, eroded	5,515	0	5,515	0.6
29	Iuka fine sandy loam, occasionally flooded	3,610	270	3,880	0.4
30	Kenn fine sandy loam, occasionally flooded	105	2,195	2,300	0.2
31	Kipling silt loam, 0 to 2 percent slopes	7,320	0	7,320	0.8
32	Kipling silty clay loam, 2 to 5 percent slopes	7,260	0	7,260	0.8
33	Kirkville fine sandy loam, occasionally flooded	160	5,600	5,760	0.6
34	Leeper silty clay, occasionally flooded	2,705	0	2,705	0.3
35	Macon fine sandy loam, 3 to 8 percent slopes	1,350	0	1,350	0.1
36	Macon fine sandy loam, 8 to 20 percent slopes	8,280	15	8,295	0.9
37	Magnet loam, 3 to 8 percent slopes	0	1,290	1,290	0.1
38	Magnet stony loam, 8 to 20 percent slopes	0	1,865	1,865	0.2
39	Magnet stony loam, 20 to 40 percent slopes	0	990	990	0.1
40	Marietta fine sandy loam, occasionally flooded	10,045	0	10,045	1.0
41	Mayhew silty clay loam, 0 to 2 percent slopes	4,625	70	4,695	0.5
42	McLaurin loamy fine sand, 1 to 3 percent slopes	835	195	1,030	0.1
43	Nugent loamy fine sand, frequently flooded	1,135	375	1,510	0.2
44	Ochlockonee fine sandy loam, occasionally flooded	5,290	625	5,915	0.6
45	Oktibbeha fine sandy loam, 3 to 8 percent slopes, eroded	11,695	35	11,730	1.2
46	Oktibbeha fine sandy loam, 8 to 12 percent slopes, eroded	4,025	140	4,165	0.4
47	Ora fine sandy loam, 3 to 8 percent slopes	3,985	305	4,290	0.4
48	Ouachita silt loam, 0 to 3 percent slopes	415	3,060	3,475	0.4
49	Ouachita silt loam, occasionally flooded	9,950	3,240	13,190	1.4
50	Ozan fine sandy loam, occasionally flooded	2,960	2,680	5,640	0.6
51	Pikeville fine sandy loam, 1 to 3 percent slopes	2,415	4,135	6,550	0.7
52	Pikeville fine sandy loam, 3 to 8 percent slopes	6,315	9,920	16,235	1.7
53	Pirum fine sandy loam, 3 to 8 percent slopes	225	1,230	1,455	0.2
54	Pirum-Sherless-Shermore fine sandy loams, 3 to 8 percent slopes	21,360	25,460	46,820	4.9
55	Pirum-Zafra-Clebit complex, 3 to 8 percent slopes	16,035	5,420	21,455	2.2
56	Pits-Fluvaquents complex, occasionally flooded	110	1,290	1,400	0.1
57	Sacul fine sandy loam, 3 to 8 percent slopes	17,195	2,285	19,480	2.0
58	Sacul fine sandy loam, 8 to 12 percent slopes	5,800	955	6,755	0.7
59	Sacul fine sandy loam, 12 to 20 percent slopes	1,210	30	1,240	0.1
60	Sacul gravelly fine sandy loam, 3 to 8 percent slopes	1,425	4,640	6,065	0.6

See footnote at end of table.

TABLE 6.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Clark County	Hot Spring County	Total-- Area	Total-- Extent
		Acres	Acres	Acres	Pct
61	Sacul gravelly fine sandy loam, 8 to 20 percent slopes	0	6,280	6,280	0.7
62	Sacul-Ruston association, undulating	6,225	2,460	8,685	0.9
63	Sacul-Smithdale association, rolling	24,515	16,920	41,435	4.3
64	Saffell gravelly fine sandy loam, 3 to 8 percent slopes	10,615	16,315	26,930	2.8
65	Saffell gravelly fine sandy loam, 8 to 12 percent slopes	2,015	3,955	5,970	0.6
66	Saffell-Sacul association, rolling	9,155	24,210	33,365	3.5
67	Sardis silt loam, 0 to 3 percent slopes	215	1,910	2,125	0.2
68	Sardis silt loam, occasionally flooded	41,725	5,695	47,420	4.9
69	Savannah fine sandy loam, 1 to 3 percent slopes	8,825	1,205	10,030	1.0
70	Savannah fine sandy loam, 3 to 8 percent slopes	12,830	860	13,690	1.4
71	Sawyer loam, 1 to 3 percent slopes	1,940	2,270	4,210	0.4
72	Sawyer loam, 3 to 8 percent slopes	2,005	2,740	4,745	0.5
73	Shermore fine sandy loam, 3 to 8 percent slopes	1,090	245	1,335	0.1
74	Sherwood fine sandy loam, 3 to 8 percent slopes	1,000	1,915	2,915	0.3
75	Sherwood fine sandy loam, 8 to 12 percent slopes	3,380	1,480	4,860	0.5
76	Smithdale fine sandy loam, 3 to 8 percent slopes	1,575	1,195	2,770	0.3
77	Smithdale-Bowie-Sacul association, undulating	160	7,745	7,905	0.8
78	Smithton very fine sandy loam, 0 to 1 percent slopes	2,815	4,765	7,580	0.8
79	Stough fine sandy loam, 0 to 2 percent slopes	14,520	18,925	33,445	3.5
80	Sumter silty clay, 3 to 12 percent slopes, eroded	3,360	0	3,360	0.4
81	Sumter silty clay, 12 to 20 percent slopes, eroded	1,080	0	1,080	0.1
82	Terouge silty clay, 1 to 3 percent slopes	1,235	125	1,360	0.1
83	Terouge silty clay, occasionally flooded	935	0	935	0.1
84	Toine fine sandy loam, occasionally flooded	11,780	9,880	21,660	2.3
85	Trebloc silt loam, 0 to 2 percent slopes	1,370	0	1,370	0.1
86	Tuscumbia silty clay, occasionally flooded	4,555	0	4,555	0.5
87	Udorthents, loamy	2,085	1,875	3,960	0.4
88	Una silty clay loam, occasionally flooded	2,680	0	2,680	0.3
89	Urbo silty clay loam, occasionally flooded	14,960	0	14,960	1.6
90	Wilcox silt loam, 1 to 3 percent slopes	5,630	0	5,630	0.6
91	Wilcox silt loam, 3 to 8 percent slopes	4,750	0	4,750	0.5
92	Wing Variant fine sandy loam, 0 to 2 percent slopes	135	2,225	2,360	0.2
93	Yanush-Ceda complex, 0 to 8 percent slopes	40	4,480	4,520	0.5
94	Yanush-Carnasaw-Bigfork complex, 8 to 20 percent slopes	2,380	18,795	21,175	2.2
95	Yanush-Bigfork-Carnasaw complex, 20 to 40 percent slopes	2,090	11,720	13,810	1.4
96	Zafra-Carnasaw-Pirum complex, 8 to 20 percent slopes	45,275	18,470	63,745	6.6
97	Zafra-Carnasaw-Clebit complex, 20 to 40 percent slopes	12,645	1,390	14,035	1.5
	Large water areas	10,540	4,461	15,001	1.6
	Total	565,190	398,067	963,257	100.0

* Less than 0.1 percent.

TABLE 7.--PRIME FARMLAND

[Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under a certain condition, the condition is specified in parentheses after the soil name]

Map symbol	Soil name
1	Adaton silt loam, 0 to 1 percent slopes (where drained sufficiently for cropland)
2	Amy silt loam, 0 to 2 percent slopes (where drained sufficiently for cropland)
3	Avilla fine sandy loam, 3 to 8 percent slopes
8	Bonnerdale fine sandy loam, 0 to 5 percent slopes
9	Bowie fine sandy loam, 1 to 3 percent slopes
10	Bowie fine sandy loam, 3 to 8 percent slopes
11	Cahaba fine sandy loam, 1 to 3 percent slopes
12	Cahaba fine sandy loam, 3 to 6 percent slopes
22	Gurdon silt loam, 1 to 3 percent slopes
23	Gurdon silt loam, occasionally flooded (where drained sufficiently for cropland)
24	Guyton silt loam, occasionally flooded (where drained sufficiently for cropland)
26	Harleston fine sandy loam, 1 to 3 percent slopes
27	Houston clay, 1 to 3 percent slopes
29	Iuka fine sandy loam, occasionally flooded
30	Kenn fine sandy loam, occasionally flooded
31	Kipling silt loam, 0 to 2 percent slopes
32	Kipling silty clay loam, 2 to 5 percent slopes
33	Kirkville fine sandy loam, occasionally flooded
34	Leeper silty clay, occasionally flooded (where drained sufficiently for cropland)
35	Macon fine sandy loam, 3 to 8 percent slopes
40	Marietta fine sandy loam, occasionally flooded
41	Mayhew silty clay loam, 0 to 2 percent slopes (where drained sufficiently for cropland)
42	McLaurin loamy fine sand, 1 to 3 percent slopes
44	Ochlockonee fine sandy loam, occasionally flooded
48	Ouachita silt loam, 0 to 3 percent slopes
49	Ouachita silt loam, occasionally flooded
50	Ozan fine sandy loam, occasionally flooded (where drained sufficiently for cropland)
51	Pikeville fine sandy loam, 1 to 3 percent slopes
52	Pikeville fine sandy loam, 3 to 8 percent slopes
67	Sardis silt loam, 0 to 3 percent slopes
68	Sardis silt loam, occasionally flooded
69	Savannah fine sandy loam, 1 to 3 percent slopes
71	Sawyer loam, 1 to 3 percent slopes
73	Shermore fine sandy loam, 3 to 8 percent slopes
76	Smithdale fine sandy loam, 3 to 8 percent slopes
78	Smithton very fine sandy loam, 0 to 1 percent slopes (where drained sufficiently for cropland)
79	Stough fine sandy loam, 0 to 2 percent slopes
82	Terouge silty clay, 1 to 3 percent slopes
83	Terouge silty clay, occasionally flooded
84	Toine fine sandy loam, occasionally flooded
85	Trebloc silt loam, 0 to 2 percent slopes (where drained sufficiently for cropland)
86	Tuscumbia silty clay, occasionally flooded (where drained sufficiently for cropland)
88	Una silty clay loam, occasionally flooded (where drained sufficiently for cropland)
89	Urbo silty clay loam, occasionally flooded (where drained sufficiently for cropland)
90	Wilcox silt loam, 1 to 3 percent slopes

TABLE 8.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Land capability	Soybeans	Grain sorghum	Rice	Bahiagrass	Tall fescue	Common bermudagrass
		Bu	Bu	Bu	AUM*	AUM*	AUM*
1---------- Adaton	IIIw	30	90	110	6.0	5.5	6.5
2---------- Amy	IIIw	25	85	---	6.0	5.5	5.5
3---------- Avilla	IIIe	---	---	---	7.0	5.5	6.5
4:							
Bigfork--------	VIe	---	---	---	---	---	---
Rock outcrop---	VIIIs	---	---	---	---	---	---
5:							
Bigfork--------	VIIe	---	---	---	---	---	---
Rock outcrop---	VIIIs	---	---	---	---	---	---
6, 7---------- Bismarck	VIe	---	---	---	3.5	---	3.0
8---------- Bonnerdale	IIe	---	---	---	6.0	6.0	5.5
9---------- Bowie	IIe	20	80	---	6.5	6.0	6.0
10---------- Bowie	IIIe	---	---	---	6.5	6.0	6.0
11, 12---------- Cahaba	IIe	25	85	---	7.0	6.5	6.0
13---------- Carnasaw-Bismarck-Sherless	IVe	---	---	---	4.0	---	4.0
14---------- Carnasaw-Bismarck-Zafra	VIe	---	---	---	---	---	---
15---------- Carnasaw-Bismarck-Zafra	VIIe	---	---	---	---	---	---
16---------- Ceda	IVs	---	---	---	4.0	3.5	4.0
17---------- Cuthbert	VIIe	---	---	---	---	---	---
18---------- Darden	IVe	---	---	---	3.5	---	3.0

See footnote at end of table.

TABLE 8.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Soybeans	Grain sorghum	Rice	Bahiagrass	Tall fescue	Common bermudagrass
		Bu	Bu	Bu	AUM*	AUM*	AUM*
19--Demopolis	VIe	---	---	---	---	---	---
20--Eutaw	IIIw	25	85	120	6.0	5.5	5.5
21--Foley	IIIw	25	85	120	5.0	6.0	5.5
22--Gurdon	IIe	30	90	---	7.0	6.0	6.0
23--Gurdon	IIw	30	90	---	7.0	6.0	6.0
24--Guyton	IVw	---	---	---	7.0	7.0	6.0
25--Guyton	VIIw	---	---	---	---	---	---
26--Harleston	IIw	25	85	---	7.0	7.0	6.5
27--Houston	IIe	30	90	120	7.5	---	6.5
28--Houston	IVe	25	85	---	7.0	---	6.0
29--Iuka	IIw	35	95	---	7.0	7.0	6.5
30--Kenn	IIw	20	80	---	6.5	6.0	6.5
31--Kipling	IIIw	25	85	120	6.0	6.0	6.5
32--Kipling	IIIe	25	85	---	6.5	5.0	6.0
33--Kirkville	IIw	35	95	---	7.5	8.0	7.0
34--Leeper	IIw	35	95	120	7.5	8.0	7.0
35--Macon	IIIe	---	---	---	7.0	---	6.5
36--Macon	VIe	---	---	---	5.5	---	5.0
37--Magnet	IVe	---	---	---	5.5	---	4.0
38--Magnet	VIs	---	---	---	---	---	---

See footnote at end of table.

TABLE 8.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Soybeans	Grain sorghum	Rice	Bahiagrass	Tall fescue	Common bermudagrass
		Bu	Bu	Bu	AUM*	AUM*	AUM*
39--Magnet	VIIs	---	---	---	---	---	---
40--Marietta	IIw	35	95	---	7.5	8.0	6.5
41--Mayhew	IIIw	30	90	120	6.5	6.5	6.5
42--McLaurin	IIs	25	85	---	6.5	---	6.5
43--Nugent	Vw	---	---	---	3.0	3.5	3.0
44--Ochlockonee	IIw	35	95	---	6.5	---	6.5
45--Oktibbeha	IVe	---	---	---	5.5	---	5.0
46--Oktibbeha	VIe	---	---	---	5.0	---	5.0
47--Ora	IIIe	20	80	---	7.0	---	6.5
48--Ouachita	IIe	35	95	---	8.0	---	7.0
49--Ouachita	IIw	35	95	---	8.0	---	8.0
50--Ozan	IVw	---	---	---	6.0	5.0	5.0
51--Pikeville	IIe	---	---	---	7.0	---	5.5
52--Pikeville	IIIe	---	---	---	6.0	---	5.5
53--Pirum	IIIe	20	80	---	6.5	---	6.0
54--Pirum-Sherless-Shermore	IVe	---	---	---	6.0	---	5.5
55--Pirum-Zafra-Clebit	VIs	---	---	---	---	---	---
56--Pits-Fluvaquents	---	---	---	---	---	---	---
57--Sacul	IVe	---	---	---	6.0	---	5.0

See footnote at end of table.

TABLE 8.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Soybeans	Grain sorghum	Rice	Bahiagrass	Tall fescue	Common bermudagrass
		Bu	Bu	Bu	AUM*	AUM*	AUM*
58, 59---------- Sacul	VIe	---	---	---	5.5	---	4.5
60---------- Sacul	IVe	---	---	---	6.0	---	5.0
61---------- Sacul	VIe	---	---	---	5.5	---	4.5
62:							
Sacul----------	IVe	---	---	---	6.0	---	5.0
Ruston---------	IIIe	25	85	---	7.5	---	6.0
63:							
Sacul----------	VIe	---	---	---	5.5	---	4.5
Smithdale------	VIe	---	---	---	6.0	---	4.5
64---------- Saffell	IIIe	---	---	---	4.5	---	3.5
65---------- Saffell	IVe	---	---	---	4.0	---	3.5
66:							
Saffell--------	VIe	---	---	---	3.5	---	3.0
Sacul----------	VIe	---	---	---	5.5	---	4.5
67---------- Sardis	IIw	35	95	---	7.5	7.5	7.5
68---------- Sardis	IIw	35	95	---	7.5	7.5	7.0
69---------- Savannah	IIe	25	85	---	7.5	---	5.5
70---------- Savannah	IIIe	20	80	---	7.0	---	4.0
71---------- Sawyer	IIe	25	85	---	7.0	---	6.0
72---------- Sawyer	IIIe	20	80	---	7.0	---	6.5
73---------- Shermore	IIIe	20	80	---	5.0	4.0	4.0
74---------- Sherwood	IIIe	---	---	---	4.0	4.0	4.0
75---------- Sherwood	VIe	---	---	---	4.0	4.0	4.0
76---------- Smithdale	IIIe	20	80	---	7.0	---	6.0

See footnote at end of table.

TABLE 8.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Soybeans	Grain sorghum	Rice	Bahiagrass	Tall fescue	Common bermudagrass
		Bu	Bu	Bu	AUM*	AUM*	AUM*
77: Smithdale	IIIe	20	80	---	7.0	---	6.0
Bowie	IIIe	---	---	---	6.5	6.0	6.0
Sacul	IVe	---	---	---	6.0	---	5.0
78--- Smithton	IIIw	25	85	---	6.5	5.5	6.5
79--- Stough	IIw	25	85	---	6.5	7.0	6.5
80--- Sumter	VIe	---	---	---	---	---	---
81--- Sumter	VIe	---	---	---	---	---	---
82--- Terouge	IIe	30	90	---	7.0	7.0	6.5
83--- Terouge	IIw	35	95	---	8.5	6.0	5.5
84--- Toine	IIw	35	95	---	6.5	---	6.5
85--- Trebloc	IIIw	25	85	---	6.5	6.5	6.5
86--- Tuscumbia	IIIw	30	90	110	6.5	7.0	6.5
87--- Udorthents	VIIe	---	---	---	---	---	---
88--- Una	IIIw	25	85	110	6.5	6.5	7.0
89--- Urbo	IIw	35	95	120	8.0	8.0	8.0
90--- Wilcox	IIIw	25	85	110	6.5	6.0	6.0
91--- Wilcox	IVe	20	80	---	6.0	6.0	5.5
92--- Wing Variant	IIIw	25	85	---	6.0	6.0	5.5
93--- Yanush-Ceda	IVe	---	---	---	---	---	---
94--- Yanush-Carnasaw-Bigfork	VIe	---	---	---	---	---	---

See footnote at end of table.

TABLE 8.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE-Continued

Soil name and map symbol	Land capability	Soybeans	Grain sorghum	Rice	Bahiagrass	Tall fescue	Common bermudagrass
		Bu	Bu	Bu	AUM*	AUM*	AUM*
95---------- Yanush-Bigfork-Carnasaw	VIIe	---	---	---	---	---	---
96---------- Zafra-Carnasaw-Pirum	VIs	---	---	---	---	---	---
97---------- Zafra-Carnasaw-Clebit	VIIs	---	---	---	---	---	---

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

TABLE 9.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Soil name and map symbol	Woodland suitability group	Management concerns					Productivity	
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index
1---------- Adaton	2w9	Slight	Severe	Moderate	Moderate	Severe	Water oak---------- Loblolly pine*------ Sweetgum----------	80 86 80
2---------- Amy	2w9	Slight	Severe	Moderate	Moderate	Severe	Loblolly pine*------ Shortleaf pine------ Sweetgum----------	86 80 90
3---------- Avilla	3o7	Slight	Slight	Slight	Slight	Moderate	Shortleaf pine*----- Southern red oak---- Loblolly pine------- Cherrybark oak------ Sweetgum----------	65 65 70 --- 70
4: Bigfork---------- Rock outcrop	5f9	Slight	Severe	Moderate	Moderate	Slight	Shortleaf pine*----- Loblolly pine-------	55 ---
5: Bigfork---------- Rock outcrop	5f9	Severe	Severe	Moderate	Moderate	Slight	Shortleaf pine*----- Loblolly pine-------	55 ---
6---------- Bismarck	5d8	Slight	Slight	Moderate	Severe	Slight	Shortleaf pine*----- Loblolly pine------- Eastern redcedar---- Post oak---------- Blackjack oak-------	45 50 30 --- ---
7---------- Bismarck	5d8	Moderate	Moderate	Moderate	Severe	Slight	Shortleaf pine*----- Loblolly pine------- Eastern redcedar---- Post oak---------- Blackjack oak-------	45 50 30 --- ---
8---------- Bonnerdale	3w8	Slight	Moderate	Slight	Slight	Severe	Loblolly pine*------ Shortleaf pine------	80 70
9, 10---------- Bowie	3o7	Slight	Slight	Slight	Slight	Moderate	Loblolly pine*------ Shortleaf pine------	83 80
11, 12---------- Cahaba	2o7	Slight	Slight	Slight	Slight	Moderate	Loblolly pine*------ Sweetgum----------	87 90
13: Carnasaw----------	3o7	Slight	Slight	Slight	Slight	Moderate	Shortleaf pine*----- Loblolly pine-------	70 80

See footnote at end of table.

TABLE 9.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Woodland suitability group	Management concerns					Productivity	
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index
13:								
Bismarck	5d8	Slight	Slight	Moderate	Severe	Slight	Shortleaf pine*	45
							Loblolly pine	50
							Eastern redcedar	30
							Post oak	---
							Blackjack oak	---
Sherless	3o7	Slight	Slight	Slight	Slight	Moderate	Shortleaf pine*	70
							White oak	---
							Southern red oak	---
							Sweetgum	---
							Blackgum	---
							Hickory	---
14:								
Carnasaw	3o7	Slight	Slight	Slight	Slight	Moderate	Shortleaf pine*	70
							Loblolly pine	80
Bismarck	5d8	Slight	Slight	Moderate	Severe	Slight	Shortleaf pine*	45
							Loblolly pine	50
							Eastern redcedar	30
							Post oak	---
							Blackjack oak	---
Zafra	4x8	Slight	Moderate	Slight	Moderate	Slight	Shortleaf pine*	65
							Southern red oak	65
15:								
Carnasaw	3r8	Moderate	Moderate	Slight	Slight	Moderate	Shortleaf pine*	70
							Loblolly pine	80
Bismarck	5d8	Moderate	Moderate	Moderate	Severe	Slight	Shortleaf pine*	45
							Loblolly pine	50
							Eastern redcedar	30
							Post oak	---
							Blackjack oak	---
Zafra	4x8	Moderate	Moderate	Slight	Moderate	Slight	Shortleaf pine*	65
							Southern red oak	65
16--Ceda	3f8	Slight	Slight	Moderate	Slight	Moderate	Shortleaf pine*	70
							Southern red oak	---
							White oak	---
							Sweetgum	80
							American sycamore	80
17--Cuthbert	4r3	Severe	Moderate	Slight	Moderate	Slight	Loblolly pine*	70
							Shortleaf pine	60
18--Darden	3s3	Slight	Moderate	Severe	Slight	Moderate	Loblolly pine	80
							Shortleaf pine*	70
19--Demopolis	5d9	Moderate	Slight	Severe	Severe	Slight	Eastern redcedar	35
20--Eutaw	3c8	Slight	Moderate	Moderate	Moderate	Severe	Sweetgum	80
							Loblolly pine*	80

See footnote at end of table.

TABLE 9.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Woodland suitability group	Management concerns					Productivity	
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index
21---------- Foley	3w8	Slight	Moderate	Moderate	Slight	Severe	Sweetgum*---------- Cherrybark oak------ Water oak---------- Loblolly pine--------	80 80 80 60
22, 23---------- Gurdon	2w8	Slight	Moderate	Slight	Slight	Severe	Loblolly pine*------ Sweetgum---------- Shortleaf pine------ Shumard oak--------- Willow oak----------	87 90 75 --- ---
24---------- Guyton	2w9	Slight	Severe	Moderate	Slight	Severe	Loblolly pine*------ Sweetgum---------- Green ash---------- Southern red oak---- Water oak----------	90 --- --- --- ---
25---------- Guyton	2w9	Slight	Severe	Severe	Slight	Severe	Baldcypress*-------- Water tupelo--------	--- ---
26---------- Harleston	2w8	Slight	Moderate	Slight	Slight	Moderate	Loblolly pine*------ Shortleaf pine------ Sweetgum----------	90 80 75
27, 28---------- Houston	4c8	Slight	Moderate	Moderate	Slight	Moderate	Eastern redcedar----	40
29---------- Iuka	1w8	Slight	Moderate	Slight	Slight	Severe	Loblolly pine*------ Sweetgum---------- Eastern cottonwood-- Water oak----------	97 100 105 100
30---------- Kenn	3o7	Slight	Slight	Slight	Slight	Moderate	Shortleaf pine*----- Southern red oak---- Sweetgum---------- Post oak----------	70 70 80 ---
31, 32---------- Kipling	2c8	Slight	Moderate	Moderate	Slight	Moderate	Cherrybark oak------ Loblolly pine*------ Shumard oak--------- Sweetgum---------- Water oak---------- White oak----------	86 86 85 90 80 80
33---------- Kirkville	1o7	Slight	Slight	Slight	Slight	Moderate	Cherrybark oak*----- Loblolly pine------- Sweetgum---------- Water oak----------	100 95 100 100
34---------- Leeper	1w5	Slight	Moderate	Moderate	Slight	Severe	Eastern cottonwood*- Sweetgum---------- Green ash---------- American sycamore---	110 95 90 100
35, 36---------- Macon	3o7	Slight	Slight	Slight	Slight	Moderate	Loblolly pine*------ Shortleaf pine------	80 70

See footnote at end of table.

TABLE 9.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Woodland suitability group	Management concerns					Productivity	
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index
37---------- Magnet	4o7	Slight	Slight	Slight	Slight	Slight	Shortleaf pine*----- Southern red oak---- White oak---------- Black walnut--------	65 60 60 ---
38---------- Magnet	4x8	Slight	Moderate	Slight	Slight	Slight	Shortleaf pine*----- Southern red oak---- White oak----------	65 60 60
39---------- Magnet	4x8	Moderate	Moderate	Moderate	Slight	Slight	Shortleaf pine*----- Southern red oak---- White oak----------	65 60 60
40---------- Marietta	1o7	Slight	Slight	Slight	Slight	Severe	Eastern cottonwood*- Green ash---------- Sweetgum---------- American sycamore---	106 90 100 105
41---------- Mayhew	2w9	Slight	Severe	Moderate	Slight	Severe	Water oak---------- White oak---------- Loblolly pine*------ Sweetgum----------	80 --- 90 90
42---------- McLaurin	3o1	Slight	Slight	Slight	Slight	Moderate	Loblolly pine*------ Shortleaf pine------	83 70
43---------- Nugent	2s8	Slight	Moderate	Moderate	Slight	Moderate	Loblolly pine*------ Sweetgum---------- Water oak---------- Willow oak----------	90 95 85 85
44---------- Ochlockonee	1o7	Slight	Slight	Slight	Slight	Severe	Eastern cottonwood-- Loblolly pine*------ Sweetgum---------- Water oak----------	100 100 90 80
45,46---------- Oktibbeha	3c8	Slight	Moderate	Slight	Slight	Moderate	Loblolly pine*------ Shortleaf pine------ Eastern redcedar---- Southern red oak----	76 66 45 70
47---------- Ora	3o7	Slight	Slight	Slight	Moderate	Moderate	Loblolly pine*------ Shortleaf pine------ Sweetgum----------	83 69 80
48, 49---------- Ouachita	1o7	Slight	Slight	Slight	Slight	Severe	Loblolly pine*------ Sweetgum---------- Eastern cottonwood--	100 100 100
50---------- Ozan	2w9	Slight	Severe	Moderate	Slight	Severe	Loblolly pine*------ Shortleaf pine------ Sweetgum---------- Water oak---------- Cherrybark oak------ Shumard oak--------- Eastern cottonwood--	95 --- 90 90 --- --- ---
51, 52---------- Pikeville	3o1	Slight	Slight	Slight	Slight	Moderate	Loblolly pine*------ Shortleaf pine------	80 70

See footnote at end of table.

TABLE 9.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Woodland Suitability group	Management concerns					Productivity	
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index
53---------- Pirum	3o7	Slight	Slight	Slight	Slight	Moderate	Loblolly pine*------ Shortleaf pine------ Southern red oak---- White oak----------	80 70 70 70
54: Pirum----------	3o7	Slight	Slight	Slight	Slight	Moderate	Loblolly pine*------ Shortleaf pine------ Southern red oak---- White oak----------	80 70 70 70
Sherless----------	3o7	Slight	Slight	Slight	Slight	Moderate	Shortleaf pine*----- White oak---------- Southern red oak---- Sweetgum----------	70 --- --- ---
Shermore----------	3o7	Slight	Slight	Slight	Slight	Moderate	Shortleaf pine*----- Southern red oak---- White oak---------- Hickory---------- Sweetgum----------	70 70 --- --- ---
55: Pirum----------	3o7	Slight	Slight	Slight	Slight	Moderate	Loblolly pine*------ Shortleaf pine------ Southern red oak---- White oak----------	80 70 70 70
Zafra----------	3x8	Slight	Moderate	Moderate	Moderate	Slight	Shortleaf pine*----- Southern red oak----	70 70
Clebit----------	5x8	Slight	Moderate	Moderate	Severe	Slight	Shortleaf pine*----- Eastern redcedar---- Post oak---------- Blackjack oak------- Winged elm----------	40 30 --- --- ---
57, 58, 59, 60, 61- Sacul	3c2	Slight	Moderate	Slight	Slight	Moderate	Loblolly pine*------ Shortleaf pine------	85 70
62: Sacul----------	3c2	Slight	Moderate	Slight	Slight	Moderate	Loblolly pine*------ Shortleaf pine------	85 70
Ruston----------	3o1	Slight	Slight	Slight	Slight	Moderate	Loblolly pine*------ Shortleaf pine------	84 75
63: Sacul----------	3c2	Slight	Moderate	Slight	Slight	Moderate	Loblolly pine*------ Shortleaf pine------	85 70
Smithdale---------	3o1	Slight	Slight	Slight	Slight	Moderate	Loblolly pine*------ Shortleaf pine------	80 69
64, 65---------- Saffell	4o1	Slight	Slight	Slight	Slight	Slight	Loblolly pine*------ Shortleaf pine------ White oak----------	70 65 ---

See footnote at end of table.

TABLE 9.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Woodland suitability group	Management concerns					Productivity	
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index
66:								
Saffell	4o1	Slight	Slight	Slight	Slight	Slight	Loblolly pine*	70
							Shortleaf pine	65
							White oak	---
Sacul	3c2	Slight	Moderate	Slight	Slight	Moderate	Loblolly pine*	85
							Shortleaf pine	70
67, 68 Sardis	1w8	Slight	Moderate	Moderate	Slight	Severe	Loblolly pine*	96
							Sweetgum	100
							Water oak	96
69, 70 Savannah	3o7	Slight	Slight	Slight	Moderate	Moderate	Loblolly pine*	80
							Shortleaf pine	76
							Southern red oak	75
71, 72 Sawyer	2o1	Slight	Slight	Slight	Slight	Moderate	Loblolly pine*	86
							Shortleaf pine	80
73 Shermore	3o7	Slight	Slight	Slight	Slight	Moderate	Shortleaf pine*	70
							Southern red oak	70
							Post oak	---
							White oak	---
74, 75 Sherwood	3o7	Slight	Slight	Slight	Slight	Moderate	Shortleaf pine*	70
							Southern red oak	60
							White oak	55
							Sweetgum	60
76 Smithdale	3o1	Slight	Slight	Slight	Slight	Moderate	Loblolly pine*	80
							Shortleaf pine	69
77:								
Smithdale	3o1	Slight	Slight	Slight	Slight	Moderate	Loblolly pine*	80
							Shortleaf pine	69
Bowie	3o7	Slight	Slight	Slight	Slight	Moderate	Loblolly pine*	83
							Shortleaf pine	74
Sacul	3c2	Slight	Moderate	Slight	Slight	Moderate	Loblolly pine*	85
							Shortleaf pine	70
78 Smithton	2w9	Slight	Severe	Moderate	Moderate	Severe	Loblolly pine*	86
							Shortleaf pine	80
							Sweetgum	90
							Cherrybark oak	90
							Water oak	90
79 Stough	2w8	Slight	Moderate	Slight	Slight	Severe	Cherrybark oak	85
							Loblolly pine*	86
							Sweetgum	85
							Water oak	80
80 Sumter	4c8	Slight	Moderate	Moderate	Moderate	Slight	Eastern redcedar*	37
81 Sumter	4r9	Moderate	Moderate	Severe	Moderate	Slight	Eastern redcedar*	37

See footnote at end of table.

TABLE 9.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Woodland suitability group	Management concerns					Productivity	
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index
82, 83---------- Terouge	4c8	Slight	Moderate	Moderate	Slight	Severe	Eastern redcedar*--- Osage orange--------	40 ---
84---------- Toine	2o7	Slight	Slight	Slight	Slight	Moderate	Loblolly pine*------ Sweetgum---------- Southern red oak---- White oak---------- Eastern cottonwood-- American sycamore---	90 90 --- --- 100 ---
85---------- Trebloc	2w9	Slight	Severe	Moderate	Slight	Severe	Loblolly pine*------ Sweetgum---------- Water oak---------- Willow oak----------	95 90 85 80
86---------- Tuscumbia	2w9	Slight	Severe	Moderate	Slight	Severe	Eastern cottonwood*- Green ash---------- Sweetgum----------	100 95 85
88---------- Una	2w9	Slight	Severe	Moderate	Slight	Severe	Sweetgum*---------- Eastern cottonwood-- Green ash---------- Cherrybark oak------ Nuttall oak--------- Water oak---------- Willow oak---------- Water tupelo--------	90 85 75 90 95 90 90 80
89---------- Urbo	1w5	Slight	Moderate	Moderate	Moderate	Severe	Green ash---------- Eastern cottonwood*- Cherrybark oak------ Sweetgum----------	93 108 99 98
90, 91---------- Wilcox	3c2	Slight	Moderate	Slight	Moderate	Moderate	Loblolly pine*------ Shortleaf pine------	81 68
92---------- Wing Variant	4w8	Slight	Moderate	Moderate	Slight	Severe	Loblolly pine------- Sweetgum---------- American sycamore--- Water oak---------- Shortleaf pine*-----	70 70 70 70 60
93: Yanush----------	4f8	Slight	Slight	Moderate	Slight	Slight	Shortleaf pine*----- Southern red oak----	65 ---
Ceda----------	3f8	Slight	Slight	Moderate	Slight	Moderate	Shortleaf pine*----- Southern red oak---- White oak---------- Sweetgum---------- American sycamore---	70 --- --- 80 80
94: Yanush----------	4f8	Slight	Slight	Moderate	Slight	Slight	Shortleaf pine*----- Southern red oak----	65 ---
Carnasaw----------	3o7	Slight	Slight	Slight	Slight	Moderate	Shortleaf pine*----- Loblolly pine-------	70 80

See footnote at end of table.

TABLE 9.--WOODLAND MANAGEMENT AND PRODUCTIVITY-Continued

Map symbol and soil name	Woodland suitability group	Management concerns					Productivity	
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index
94:								
Bigfork	5f8	Slight	Slight	Moderate	Moderate	Slight	Shortleaf pine*	40
							Post oak	---
							Blackjack oak	---
95:								
Yanush	4f8	Moderate	Moderate	Moderate	Slight	Slight	Shortleaf pine*	65
							Southern red oak	---
Bigfork	5f8	Moderate	Moderate	Moderate	Moderate	Slight	Shortleaf pine*	40
							Post oak	---
							Blackjack oak	---
Carnasaw	3r8	Moderate	Moderate	Slight	Slight	Moderate	Shortleaf pine*	70
							Loblolly pine	80
96:								
Zafra	4x8	Slight	Moderate	Slight	Moderate	Slight	Shortleaf pine*	65
							Southern red oak	65
Carnasaw	3o7	Slight	Slight	Slight	Slight	Moderate	Shortleaf pine*	70
							Loblolly pine	80
Pirum	3o7	Slight	Slight	Slight	Slight	Moderate	Loblolly pine*	80
							Shortleaf pine	70
							Southern red oak	70
							White oak	70
97:								
Zafra	4x8	Moderate	Moderate	Slight	Moderate	Slight	Shortleaf pine*	65
							Southern red oak	65
Carnasaw	3r8	Moderate	Moderate	Slight	Slight	Moderate	Shortleaf pine*	70
							Loblolly pine	80
Clebit	5x8	Moderate	Moderate	Moderate	Severe	Slight	Shortleaf pine*	40
							Eastern redcedar	30
							Post oak	---
							Blackjack oak	---
							Winged elm	---

* Species is the indicator for the index data.

TABLE 10.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
1---------- Adaton	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
2---------- Amy	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
3---------- Avilla	Severe: flooding.	Slight----------	Moderate: slope.	Slight.
4: Bigfork---------- Rock outcrop.	Moderate: small stones.	Moderate: small stones.	Severe: small stones,	Slfght:
5: Bigfork---------- Rock outcrop.	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slopes.
6---------- Bismarck	Severe: small stones, depth to rock.	Severe: small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: small stones.
7---------- Bismarck	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: small stones.
8---------- Bonnerdale	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
9, 10---------- Bowie	Slight----------	Slight----------	Moderate: slope.	Slight.
11, 12---------- Cahaba	Severe: flooding.	Slight----------	Moderate: slope.	Slight.
13: Carnasaw---------- Bismarck---------- Sherless----------	Moderate: small stones, percs slowly. Severe: small stones, depth to rock. Slight----------	Moderate: small stones, percs slowly. Severe: small stones, depth to rock. Slight----------	Severe: small stones. Severe: small stones, depth to rock. Moderate: small stones.	Slight. Severe: small stones. Slight.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
14: Carnasaw	Moderate: slope, small stones, percs slowly.	Moderate: slope, small stones,	Severe: slope, small stones.	Slight.
Bismarck	Severe: small stones, depth to rock.	Severe: small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: small stones.
Zafra	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Moderate: large stones.
15: Carnasaw	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Bismarck	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, small stones.
Zafra	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
16--- Ceda	Severe: flooding, small stones.	Severe: small stones.	Severe: small stones.	Slight.
17--- Cuthbert	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.
18--- Darden	Moderate: too sandy, slope.	Moderate: too sandy, slope.	Severe: slope.	Moderate: too sandy.
19--- Demopolis	Severe: small stones, depth to rock.	Severe: small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Slight.
20--- Eutaw	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.
21--- Foley	Severe: wetness, percs slowly.	Severe: wetness, excess sodium, percs slowly.	Severe: wetness, percs slowly, excess sodium.	Severe: wetness.
22, 23--- Gurdon	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Severe: erodes easily.
24--- Guyton	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, erodes easily.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
25--- Guyton	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.
26--- Harleston	Severe: flooding.	Moderate: wetness.	Moderate: slope, small stones, wetness.	Slight.
27, 28--- Houston	Severe: percs slowly, too clayey.	Severe: too clayey, percs slowly.	Severe: too clayey, percs slowly.	Severe: too clayey, erodes easily.
29--- Iuka	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.
30--- Kenn	Severe: flooding.	Slight---	Moderate: small stones, flooding.	Slight.
31--- Kipling	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.
32--- Kipling	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.
33--- Kirkville	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Moderate: wetness.
34--- Leeper	Severe: flooding, wetness, percs slowly.	Severe: too clayey, percs slowly.	Severe: too clayey, wetness.	Severe: too clayey.
35--- Macon	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight.
36--- Macon	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight.
37--- Magnet	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, depth to rock.	Severe: erodes easily.
38--- Magnet	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight.
39--- Magnet	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
40--Marietta	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Moderate: wetness.
41--Mayhew	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.
42--McLaurin	Slight	Slight	Moderate: slope.	Slight.
43--Nugent	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.
44--Ochlockonee	Severe: flooding.	Slight	Moderate: flooding.	Slight.
45--Oktibbeha	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Slight.
46--Oktibbeha	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.
47--Ora	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight.
48--Ouachita	Severe: flooding.	Moderate: percs slowly.	Moderate: percs slowly.	Severe: erodes easily.
49--Ouachita	Severe: flooding.	Moderate: percs slowly.	Moderate: flooding, percs slowly.	Slight.
50--Ozan	Severe: flooding, wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.
51, 52--Pikeville	Slight	Slight	Moderate: slope.	Slight.
53--Pirum	Slight	Slight	Moderate: slope, small stones.	Slight.
54:				
Pirum	Slight	Slight	Moderate: slope, small stones.	Slight.
Sherless	Slight	Slight	Moderate: small stones.	Slight.
Shermore	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: wetness, percs slowly, slope.	Moderate: wetness.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
55:				
Pirum	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight.
Zafra	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Moderate: large stones.
Clebit	Severe: small stones, depth to rock.	Severe: small stones, depth to rock.	Severe: small stones, depth to rock, large stones.	Moderate: large stones.
56:				
Pits.				
Fluvaquents.				
57	Moderate:	Moderate:	Moderate:	Slight.
Sacul	percs slowly.	percs slowly.	slope, percs slowly.	
58	Moderate:	Moderate:	Severe:	Slight.
Sacul	slope, percs slowly.	slope, percs slowly.	slope.	
59	Severe:	Severe:	Severe:	Moderate:
Sacul	slope.	slope.	slope.	slope.
60	Moderate:	Moderate:	Moderate:	Slight.
Sacul	percs slowly.	percs slowly.	slope, percs slowly.	
61	Moderate:	Moderate:	Severe:	Slight.
Sacul	slope, percs slowly.	slope, percs slowly.	slope.	
62:				
Sacul	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight.
Ruston	Slight	Slight	Moderate: slope, small stones.	Slight.
63:				
Sacul	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight.
Smithdale	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
64	Moderate:	Moderate:	Severe:	Slight.
Saffell	small stones.	small stones.	small stones.	
65	Moderate:	Moderate:	Severe:	Slight.
Saffell	slope, small stones.	slope, small stones.	slope, small stones.	

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
66: Saffell	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight.
Sacul	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight.
67, 68 Sardis	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Severe: erodes easily.
69, 70 Savannah	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.
71, 72 Sawyer	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight.
73 Shermore	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: wetness, percs slowly, slope.	Moderate: wetness.
74 Sherwood	Slight	Slight	Moderate: slope, small stones, depth to rock.	Slight.
75 Sherwood	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
76 Smithdale	Slight	Slight	Moderate: slope, small stones.	Slight.
77: Smithdale	Slight	Slight	Moderate: slope, small stones.	Slight.
Bowie	Slight	Slight	Moderate: slope.	Slight.
Sacul	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight.
78 Smithton	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
79 Stough	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
80--Sumter	Severe: too clayey.	Severe: too clayey.	Severe: slope, too clayey.	Severe: too clayey, erodes easily.
81--Sumter	Severe: slope, too clayey.	Severe: slope, too clayey.	Severe: slope, too clayey.	Severe: too clayey, erodes easily.
82, 83--Terouge	Severe: flooding, wetness, percs slowly.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey, wetness.	Severe: wetness, too clayey.
84--Toine	Severe: flooding.	Slight	Moderate: small stones, flooding.	Slight.
85--Trebloc	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
86--Tuscumbia	Severe: flooding, wetness, percs slowly.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey, wetness.	Severe: wetness, too clayey.
87: Udorthents.				
88--Una	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
89--Urbo	Severe: flooding, wetness, percs slowly.	Severe: percs slowly.	Severe: wetness.	Moderate: flooding, wetness.
90, 91--Wilcox	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Slight.
92--Wing Variant	Severe: wetness, percs slowly, excess sodium.	Severe: wetness, excess sodium, percs slowly.	Severe: wetness, percs slowly, excess sodium.	Severe: wetness.
93: Yanush	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight.
Ceda	Severe: flooding, small stones.	Severe: small stones.	Severe: flooding, small stones.	Moderate: flooding.
94: Yanush	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
94:				
Carnasaw	Moderate: slope, small stones, percs slowly.	Moderate: slope, small stones, percs slowly.	Severe: slope, small stones.	Slight.
Bigfork	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones,	Slight.
95:				
Yanush	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Bigfork	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Carnasaw	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
96:				
Zafra	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Moderate: large stones.
Carnasaw	Moderate: slope, small stones, percs slowly.	Moderate: slope, small stones, percs slowly.	Severe: slope, small stones.	Slight.
Pirum	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight.
97:				
Zafra	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Carnasaw	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Clebit	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, large stones.	Severe: slope.

TABLE 11.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
1---------- Adaton	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
2---------- Amy	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Good	Good.
3---------- Avilla	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
4, 5: Bigfork----------	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop.										
6---------- Bismarck	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
7---------- Bismarck	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
8---------- Bonnerdale	Fair	Good	Good	Good	Good	Fair	Very poor.	Good	Good	Poor.
9---------- Bowie	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
10---------- Bowie	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
11, 12---------- Cahaba	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
13: Carnasaw----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Bismarck----------	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
Sherless----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
14: Carnasaw----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Bismarck----------	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
Zafra----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
15: Carnasaw----------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.

TABLE 11.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
15: Bismarck	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
Zafra	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
16--Ceda	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
17--Cuthbert	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
18--Darden	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
19--Demopolis	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
20--Eutaw	Poor	Fair	Fair	Fair	Fair	Poor	Good	Fair	Fair	Fair.
21--Foley	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
22, 23--Gurdon	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
24--Guyton	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
25--Guyton	Very poor.	Very poor.	Very poor.	Very poor.	---	Good	Good	Poor	Very poor.	Good.
26--Harleston	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
27, 28--Houston	Fair	Fair	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
29--Iuka	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
30--Kenn	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
31--Kipling	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
32--Kipling	Fair	Good	Good	Good	Good	Poor	Fair	Good	Good	Poor.
33--Kirkville	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
34--Leeper	Good	Good	Fair	Good	Good	Fair	Good	Good	Good	Fair.
35, 36--Macon	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

TABLE 11.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
37---------- Magnet	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
38---------- Magnet	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
39---------- Magnet	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
40---------- Marietta	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
41---------- Mayhew	Poor	Fair	Good	Fair	Fair	Fair	Fair	Fair	Fair	Fair.
42---------- McLaurin	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
43---------- Nugent	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
44---------- Ochlockonee	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
45, 46---------- Oktibbeha	Fair	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
47---------- Ora	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
48, 49---------- Ouachita	Good	Good	Good	Good	Good	Good	Fair	Good	Good	Fair.
50---------- Ozan	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
51, 52---------- Pikeville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
53---------- Pirum	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
54:										
Pirum----------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Sherless----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Shermore----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
55:										
Pirum----------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Zafra----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Clebit----------	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.

TABLE 11.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
56: Pits.										
Fluvaquents.										
57, 58---------- Sacul	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
59---------- Sacul	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
60, 61---------- Sacul	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
62: Sacul----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Ruston----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
63: Sacul----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Smithdale---------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
64, 65---------- Saffell	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
66: Saffell----------	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Sacul----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
67, 68---------- Sardis	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
69---------- Savannah	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
70---------- Savannah	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
71---------- Sawyer	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
72---------- Sawyer	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
73---------- Shermore	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
74---------- Sherwood	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
75---------- Sherwood	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

TABLE 11.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
76---------- Smithdale	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
77: Smithdale---------	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Bowie----------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Sacul----------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
78---------- Smithton	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
79---------- Stough	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
80---------- Sumter	Fair	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
81---------- Sumter	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
82---------- Terouge	Fair	Fair	Fair	Good	Good	Poor	Poor	Fair	Good	Poor.
83---------- Terouge	Fair	Fair	Fair	Good	Good	Poor	Fair	Fair	Good	Poor.
84---------- Toine	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
85---------- Trebloc	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
86---------- Tuscumbia	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
87: Udorthents.										
88---------- Una	Poor	Fair	Good	Fair	Fair	Good	Good	Fair	Fair	Good.
89---------- Urbo	Fair	Good	Fair	Good	Good	Good	Good	Fair	Good	Good.
90---------- Wilcox	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
91---------- Wilcox	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
92---------- Wing Variant	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
93: Yanush----------	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Good	Very poor.

TABLE 11.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
93:										
Ceda	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
94:										
Yanush	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Good	Very poor.
Carnasaw	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Bigfork	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
95:										
Yanush	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Bigfork	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Carnasaw	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
96:										
Zafra	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Carnasaw	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Pirum	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
97:										
Zafra	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Carnasaw	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Clebit	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.

TABLE 12.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
1---------- Adaton	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness.
2---------- Amy	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness.
3---------- Avilla	Slight----------	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
4: Bigfork----------	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: depth to rock, slope.	Moderate: depth to rock.
Rock outcrop.					
5: Bigfork----------	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.
Rock outcrop.					
6---------- Bismarck	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.
7---------- Bismarck	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.
8---------- Bonnerdale	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
9---------- Bowie	Moderate: wetness.	Slight----------	Moderate: wetness.	Slight----------	Slight.
10---------- Bowie	Moderate: wetness.	Slight----------	Moderate: wetness.	Moderate: slope.	Slight.
11, 12---------- Cahaba	Slight----------	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
13: Carnasaw---------	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
Bismarck---------	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.
Sherless---------	Moderate: depth to rock.	Slight----------	Moderate: depth to rock.	Moderate: slope.	Slight.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
14: Carnasaw	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.
Bismarck	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope.
Zafra	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope.
15: Carnasaw	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.
Bismarck	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.
Zafra	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.
16--- Ceda	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
17--- Cuthbert	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.
18--- Darden	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
19--- Demopolis	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.
20--- Eutaw	Severe: cutbanks cave, wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.
21--- Foley	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.
22--- Gurdon	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Moderate: wetness, flooding.
23--- Gurdon	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.
24--- Guyton	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
25---------- Guyton	Severe: flooding, ponding, cutbanks cave.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding, low strength.
26---------- Harleston	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.
27, 28---------- Houston	Severe: cutbanks cave.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
29---------- Iuka	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.
30---------- Kenn	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
31, 32---------- Kipling	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
33---------- Kirkville	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.
34---------- Leeper	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, flooding, shrink-swell.
35---------- Macon	Slight----------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength, shrink-swell.
36---------- Macon	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: low strength, slope, shrink-swell.
37---------- Magnet	Moderate: depth to rock, too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
38---------- Magnet	Moderate: depth to rock, too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.
39---------- Magnet	Severe: slope.	Severe: shrink-swell, slope.	Severe: shrink-swell, slope.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell, slope.
40---------- Marietta	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
41--- Mayhew	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell, low strength.
42--- McLaurin	Severe: cutbanks cave.	Slight---	Slight---	Slight---	Slight.
43--- Nugent	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
44--- Ochlockonee	Moderate: wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
45--- Oktibbeha	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.
46--- Oktibbeha	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.
47--- Ora	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: low strength, wetness.
48--- Ouachita	Slight---	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength.
49--- Ouachita	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.
50--- Ozan	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.
51--- Pikeville	Slight---	Slight---	Slight---	Slight---	Slight.
52--- Pikeville	Slight---	Slight---	Slight---	Moderate: slope.	Slight.
53--- Pirum	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.
54:					
Pirum---	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.
Sherless---	Moderate: depth to rock.	Slight---	Moderate: depth to rock.	Moderate: slope.	Slight.
Shermore---	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: wetness.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
55: Pirum	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.
Zafra	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.
Clebit	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
56: Pits. Fluvaquents.					
57--- Sacul	Moderate: too clayey, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
58--- Sacul	Moderate: too clayey, slope, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.
59--- Sacul	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.
60--- Sacul	Moderate: too clayey, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
61--- Sacul	Moderate: too clayey, slope, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.
62: Sacul	Moderate: too clayey, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
Ruston	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength.
63: Sacul	Moderate: too clayey, slope, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.
Smithdale	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
64--- Saffell	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight.
65--- Saffell	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
66: Saffell	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
Sacul	Moderate: too clayey, slope, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.
67--- Sardis	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength.
68--- Sardis	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, flooding.
69--- Savannah	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
70--- Savannah	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: wetness.
71--- Sawyer	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Moderate: wetness, shrink-swell.	Severe: low strength.
72--- Sawyer	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Moderate: wetness, shrink-swell, slope.	Severe: low strength.
73--- Shermore	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: wetness.
74--- Sherwood	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.
75--- Sherwood	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope.
76--- Smithdale	Slight---	Slight---	Slight---	Moderate: slope.	Slight.
77: Smithdale	Slight---	Slight---	Slight---	Moderate: slope.	Slight.
Bowie	Moderate: wetness.	Slight---	Moderate: wetness.	Moderate: slope, wetness.	Slight.
Sacul	Moderate: too clayey, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
78---------- Smithton	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness.
79---------- Stough	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: wetness, flooding.	Moderate: wetness.
80---------- Sumter	Moderate: depth to rock, too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.
81---------- Sumter	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.
82---------- Terouge	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, wetness, shrink-swell.
83---------- Terouge	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, wetness, flooding.
84---------- Toine	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
85---------- Trebloc	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.
86---------- Tuscumbia	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, wetness, flooding.
87: Udorthents.					
88---------- Una	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, wetness, flooding.
89---------- Urbo	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, flooding.
90, 91---------- Wilcox	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
92---------- Wing Variant	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.

TABLE 12.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
93:					
Yanush	Slight	Slight	Slight	Moderate: slope.	Moderate: shrink-swell.
Ceda	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
94:					
Yanush	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
Carnasaw	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.
Bigfork	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope.
95:					
Yanush	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Bigfork	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.
Carnasaw	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.
96:					
Zafra	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope.
Carnasaw	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.
Pirum	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope.
97:					
Zafra	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.
Carnasaw	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.
Clebit	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.

TABLE 13.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
1---------- Adaton	Severe: percs slowly, wetness.	Slight----------	Severe: wetness, too clayey.	Severe: wetness.	Poor: wetness, too clayey, hard to pack.
2---------- Amy	Severe: wetness, percs slowly.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
3---------- Avilla	Moderate: flooding, percs slowly.	Moderate: seepage.	Slight----------	Moderate: flooding.	Fair: too clayey.
4: Bigfork---------- Rock outcrop.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim.
5: Bigfork---------- Rock outcrop.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, slope.
6---------- Bismarck	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, small stones.
7---------- Bismarck	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, small stones, slope.
8---------- Bonnerdale	Severe: wetness.	Severe: seepage, wetness.	Severe: depth to rock, wetness.	Severe: seepage, wetness.	Poor: wetness.
9, 10---------- Bowie	Severe: percs slowly, wetness.	Moderate: seepage, wetness, slope.	Moderate: wetness.	Slight----------	Good.
11, 12---------- Cahaba	Moderate: flooding.	Severe: seepage, flooding.	Severe: seepage.	Moderate: flooding.	Fair: thin layer.
13: Carnasaw----------	Severe: percs slowly.	Moderate: depth to rock, slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock.	Poor: too clayey, hard to pack.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
13:					
Bismarck	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, small stones.
Sherless	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, thin layer.
14:					
Carnasaw	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.
Bismarck	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, small stones.
Zafra	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, small stones.
15:					
Carnasaw	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
Bismarck	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, small stones, slope.
Zafra	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, small stones, slope.
16--- Ceda	Severe: flooding, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage.	Severe: flooding, seepage.	Poor: small stones, seepage.
17--- Cuthbert	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, slope.
18--- Darden	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: seepage.
19--- Demopolis	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, small stones.
20--- Eutaw	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
21---------- Foley	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, excess sodium.	Severe: wetness.	Poor: hard to pack, wetness, excess sodium.
22---------- Gurdon	Severe: wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
23---------- Gurdon	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
24---------- Guyton	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
25---------- Guyton	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
26---------- Harleston	Severe: wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
27, 28---------- Houston	Severe: percs slowly.	Moderate: depth to rock, slope, wetness.	Severe: depth to rock, wetness, too clayey.	Moderate: depth to rock, wetness.	Poor: too clayey, hard to pack.
29---------- Iuka	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
30---------- Kenn	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Poor: small stones.
31, 32---------- Kipling	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
33---------- Kirkville	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
34---------- Leeper	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
35---------- Macon	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
36---------- Macon	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
37--- Magnet	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
38--- Magnet	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
39--- Magnet	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey, slope.	Severe: depth to rock, slope.	Poor: area reclaim, too clayey, hard to pack.
40--- Marietta	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
41--- Mayhew	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
42--- McLaurin	Moderate: percs slowly.	Severe: seepage.	Slight	Severe: seepage.	Good.
43--- Nugent	Severe: flooding, wetness.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage.	Poor: seepage.
44--- Ochlockonee	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Fair: wetness.
45--- Oktibbeha	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
46--- Oktibbeha	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
47--- Ora	Severe: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Fair: wetness.
48--- Ouachita	Severe: percs slowly.	Severe: flooding.	Severe: seepage.	Moderate: flooding.	Fair: too clayey.
49--- Ouachita	Severe: flooding, percs slowly.	Severe: flooding.	Severe: flooding, seepage.	Severe: flooding.	Fair: too clayey.
50--- Ozan	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
51, 52--- Pikeville	Slight---	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: small stones.
53--- Pirum	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim.
54:					
Pirum---	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim.
Sherless---	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, thin layer.
Shermore---	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
55:					
Pirum---	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim.
Zafra---	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, small stones.
Clebit---	Severe: depth to rock.	Severe: depth to rock, seepage, large stones.	Severe: depth to rock, seepage, large stones.	Severe: depth to rock, seepage.	Poor: area reclaim, small stones, thin layer.
56: Pits. Fluvaquents.					
57--- Sacul	Severe: percs slowly, wetness.	Severe: wetness.	Severe: too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
58--- Sacul	Severe: percs slowly, wetness.	Severe: slope, wetness.	Severe: too clayey.	Moderate: slope, wetness.	Poor: too clayey, hard to pack.
59--- Sacul	Severe: percs slowly, slope, wetness.	Severe: slope, wetness.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
60--- Sacul	Severe: percs slowly, wetness.	Severe: wetness.	Severe: too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
61--- Sacul	Severe: percs slowly, wetness.	Severe: slope, wetness.	Severe: too clayey.	Moderate: slope, wetness.	Poor: too clayey, hard to pack.
62:					
Sacul---	Severe: percs slowly, wetness.	Severe: wetness.	Severe: too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Ruston	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
63: Sacul	Severe: percs slowly, wetness.	Severe: slope, wetness.	Severe: too clayey.	Moderate: slope, wetness.	Poor: too clayey, hard to pack.
Smithdale	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: too clayey, slope.
64--Saffell	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Slight	Poor: small stones.
65--Saffell	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage.	Moderate: slope.	Poor: small stones.
66: Saffell	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage.	Moderate: slope.	Poor: small stones.
Sacul	Severe: percs slowly, wetness.	Severe: slope, wetness.	Severe: too clayey.	Moderate: slope, wetness.	Poor: too clayey, hard to pack.
67--Sardis	Severe: wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
68--Sardis	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
69, 70--Savannah	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
71, 72--Sawyer	Severe: wetness, percs slowly.	Severe: wetness.	Severe: too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
73--Shermore	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
74--Sherwood	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock, seepage.	Poor: area reclaim.
75--Sherwood	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock, seepage.	Poor: area reclaim.
76--Smithdale	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: too clayey.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
77: Smithdale	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: too clayey.
Bowie	Severe: percs slowly, wetness.	Moderate: seepage, wetness, slope.	Moderate: wetness.	Slight	Good.
Sacul	Severe: percs slowly, wetness.	Severe: wetness.	Severe: too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
78--- Smithton	Severe: wetness, percs slowly.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
79--- Stough	Severe: wetness, percs slowly.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness.	Poor: wetness.
80--- Sumter	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, hard to pack.
81--- Sumter	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: area reclaim, hard to pack, slope.
82--- Terouge	Severe: wetness, percs slowly.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
83--- Terouge	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
84--- Toine	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.
85--- Trebloc	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, wetness.
86--- Tuscumbia	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
87: Udorthents.					
88--- Una	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
89---------- Urbo	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
90, 91---------- Wilcox	Severe: wetness, percs slowly.	Severe: wetness.	Severe: depth to rock, wetness.	Moderate: depth to rock, wetness.	Poor: too clayey, hard to pack.
92---------- Wing Variant	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey, excess sodium.	Severe: wetness.	Poor: hard to pack, wetness, excess sodium.
93: Yanush----------	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Poor: small stones.
Ceda----------	Severe: flooding, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage.	Severe: flooding, seepage.	Poor: small stones, seepage.
94: Yanush----------	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Poor: small stones.
Carnasaw----------	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.
Bigfork----------	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim.
95: Yanush----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: small stones, slope.
Bigfork----------	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, slope.
Carnasaw----------	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
96: Zafra----------	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, small stones.
Carnasaw----------	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.

TABLE 13.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
96:					
Pirum	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim.
97:					
Zafra	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, small stones, slope.
Carnasaw	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
Clebit	Severe: depth to rock, slope.	Severe: depth to rock, slope, seepage.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, small stones, slope.

TABLE 14.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
1---------- Adaton	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, thin layer.
2---------- Amy	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
3---------- Avilla	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
4: Bigfork----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: large stones, area reclaim.
Rock outcrop.				
5: Bigfork----------	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Rock outcrop.				
6---------- Bismarck	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
7---------- Bismarck	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
8---------- Bonnerdale	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
9, 10---------- Bowie	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
11, 12---------- Cahaba	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.
13: Carnasaw----------	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Bismarck----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
13: Sherless	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
14: Carnasaw	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Bismarck	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
Zafra	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
15: Carnasaw	Poor: low strength, slope, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Bismarck	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
Zafra	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
16--- Ceda	Good	Improbable: small stones.	Probable	Poor: small stones, area reclaim.
17--- Cuthbert	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
18--- Darden	Good	Probable	Improbable: too sandy.	Fair: too sandy, slope.
19--- Demopolis	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
20--- Eutaw	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
21--- Foley	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.
22, 23--- Gurdon	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
24, 25--- Guyton	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
26---------- Harleston	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
27, 28---------- Houston	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
29---------- Iuka	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
30---------- Kenn	Fair: shrink-swell.	Improbable: small stones.	Probable----------	Poor: small stones, area reclaim.
31, 32---------- Kipling	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
33---------- Kirkville	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
34---------- Leeper	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
35---------- Macon	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
36---------- Macon	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer, slope.
37, 38---------- Magnet	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
39---------- Magnet	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
40---------- Marietta	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
41---------- Mayhew	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
42---------- McLaurin	Good----------	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, small stones.
43---------- Nugent	Good----------	Probable----------	Improbable: too sandy.	Fair: too sandy, small stones.
44---------- Ochlockonee	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
45, 46---------- Oktibbeha	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, thin layer.
47---------- Ora	Fair: low strength, thin layer, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
48, 49---------- Ouachita	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
50---------- Ozan	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
51, 52---------- Pikeville	Good----------	Improbable: excess fines.	Probable----------	Poor: small stones, area reclaim.
53---------- Pirum	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones.
54: Pirum----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones.
Sherless----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Shermore----------	Fair: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
55: Pirum----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones.
Zafra----------	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Clebit----------	Poor: area reclaim, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, large stones.
56: Pits.				
Fluvaquents.				
57, 58---------- Sacul	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
59---------- Sacul	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
60, 61---------- Sacul	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
62:				
Sacul	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Ruston	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
63:				
Sacul	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Smithdale	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
64, 65--- Saffell	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
66:				
Saffell	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Sacul	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
67, 68--- Sardis	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
69, 70--- Savannah	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
71, 72--- Sawyer	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
73--- Shermore	Fair: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
74, 75--- Sherwood	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
76--- Smithdale	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
77:				
Smithdale	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Bowie	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
Sacul	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
78--- Smithton	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
79--Stough	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
80--Sumter	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
81--Sumter	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, too clayey.
82, 83--Terouge	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
84--Toine	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
85--Trebloc	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
86--Tuscumbia	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
87: Udorthents.				
88--Una	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
89--Urbo	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
90, 91--Wilcox	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
92--Wing Variant	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess sodium, wetness.
93: Yanush	Fair: shrink-swell, large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, thin layer, large stones.
Ceda	Good	Improbable: small stones.	Probable	Poor: small stones, area reclaim.
94: Yanush	Fair: shrink-swell, large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, thin layer, large stones.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
94:				
Carnasaw	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Bigfork	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: large stones, area reclaim.
95:				
Yanush	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope, thin layer.
Bigfork	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Carnasaw	Poor: low strength, slope, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
96:				
Zafra	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Carnasaw	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Pirum	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones, slope.
97:				
Zafra	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Carnasaw	Poor: low strength, slope, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Clebit	Poor: area reclaim, slope, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.

TABLE 15.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
1---------- Adaton	Slight---------	Severe: wetness.	Percs slowly---	Wetness, percs slowly.	Percs slowly, wetness.	Wetness, percs slowly.
2---------- Amy	Moderate: seepage.	Severe: wetness.	Percs slowly---	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
3---------- Avilla	Slight---------	Severe: piping.	Deep to water	Slope----------	Favorable------	Favorable.
4: Bigfork----------	Moderate: seepage, depth to rock, slope.	Moderate: large stones.	Deep to water	Droughty, depth to rock.	Large stones, depth to rock.	Large stones, droughty, depth to rock.
Rock outcrop.						
5: Bigfork----------	Severe: slope.	Moderate: large stones.	Deep to water	Droughty, slope.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Rock outcrop.						
6---------- Bismarck	Severe: depth to rock.	Severe: thin layer.	Deep to water	Droughty, depth to rock, slope.	Depth to rock	Droughty, depth to rock.
7---------- Bismarck	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Droughty, depth to rock, slope.	Slope, depth to rock.	Slope, droughty, depth to rock.
8---------- Bonnerdale	Severe: seepage.	Severe: thin layer, wetness.	Favorable------	Wetness, percs slowly.	Wetness--------	Wetness.
9---------- Bowie	Moderate: seepage.	Moderate: piping.	Deep to water	Favorable------	Favorable------	Favorable.
10---------- Bowie	Moderate: seepage.	Moderate: piping.	Deep to water	Slope----------	Favorable------	Favorable.
11---------- Cahaba	Severe: seepage.	Moderate: thin layer, piping.	Deep to water	Favorable------	Favorable------	Favorable.
12---------- Cahaba	Severe: seepage, slope.	Moderate: thin layer, piping.	Deep to water	Slope----------	Favorable------	Favorable.
13: Carnasaw---------	Moderate: depth to rock, slope.	Moderate: thin layer, hard to pack.	Deep to water	Percs slowly, slope.	Erodes easily, percs slowly.	Erodes easily, percs slowly.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
13: Bismarck	Severe: depth to rock.	Severe: thin layer.	Deep to water	Droughty, depth to rock, slope.	Depth to rock	Droughty, depth to rock.
Sherless	Moderate: seepage, depth to rock, slope.	Moderate: thin layer, piping.	Deep to water	Depth to rock, slope.	Large stones, depth to rock.	Large stones, depth to rock.
14, 15: Carnasaw	Severe: slope.	Moderate: thin layer, hard to pack.	Deep to water	Percs slowly, slope.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
Bismarck	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Droughty, depth to rock, slope.	Slope, depth to rock.	Slope, droughty, depth to rock.
Zafra	Severe: slope.	Severe: seepage.	Deep to water	Droughty, depth to rock, slope.	Slope, depth to rock.	Slope, droughty, depth to rock.
16--- Ceda	Severe: seepage.	Severe: seepage.	Deep to water	Flooding, droughty.	Large stones---	Droughty, large stones.
17--- Cuthbert	Severe: slope.	Moderate: piping.	Deep to water	Droughty, percs slowly.	Slope, erodes easily, percs slowly.	Slope, erodes easily, droughty.
18--- Darden	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, slope.	Slope---	Slope, droughty.
19--- Demopolis	Severe: depth to rock.	Severe: thin layer.	Deep to water	Depth to rock, slope.	Depth to rock	Depth to rock.
20--- Eutaw	Slight---	Severe: hard to pack, wetness.	Percs slowly---	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
21--- Foley	Slight---	Severe: wetness, excess sodium.	Percs slowly, excess sodium.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, excess sodium, erodes easily.
22--- Gurdon	Moderate: seepage.	Severe: piping, wetness.	Favorable---	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
23--- Gurdon	Moderate: seepage.	Severe: piping, wetness.	Flooding---	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
24--- Guyton	Moderate: seepage.	Severe: piping, wetness.	Percs slowly, flooding.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
25--- Guyton	Slight---	Moderate: erodes easily, low strength, compressible.	Flooding, cutbanks cave, percs slowly.	Not needed---	Not needed---	Not needed.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
26--- Harleston	Moderate: seepage.	Severe: piping.	Favorable---	Wetness---	Wetness---	Favorable.
27--- Houston	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Slow intake, percs slowly.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
28--- Houston	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Slow intake, percs slowly, slope.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
29--- Iuka	Moderate: seepage.	Severe: piping, wetness.	Flooding---	Wetness, flooding.	Wetness---	Wetness.
30--- Kenn	Moderate: seepage.	Moderate: piping, large stones.	Deep to water	Droughty, flooding.	Large stones---	Large stones, droughty.
31--- Kipling	Slight---	Severe: hard to pack.	Percs slowly---	Wetness, percs slowly.	Wetness, percs slowly.	Percs slowly.
32--- Kipling	Slight---	Severe: hard to pack.	Percs slowly, slope.	Wetness, percs slowly, slope.	Wetness, percs slowly.	Percs slowly.
33--- Kirkville	Moderate: seepage.	Severe: piping, wetness.	Flooding---	Wetness, flooding.	Wetness---	Favorable.
34--- Leeper	Slight---	Severe: hard to pack, wetness.	Percs slowly, flooding.	Wetness, slow intake, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
35--- Macon	Slight---	Moderate: piping.	Deep to water	Percs slowly, slope.	Percs slowly---	Percs slowly.
36--- Macon	Slight---	Moderate: piping.	Deep to water	Percs slowly, slope.	Slope, percs slowly.	Slope, percs slowly.
37--- Magnet	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Depth to rock, slope, erodes easily.	Depth to rock, erodes easily.	Erodes easily, depth to rock.
38--- Magnet	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Depth to rock, slope.	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
39--- Magnet	Severe: slope.	Severe: hard to pack.	Deep to water	Depth to rock, slope.	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
40--- Marietta	Moderate: seepage.	Severe: wetness.	Flooding---	Wetness, flooding.	Wetness---	Favorable.
41--- Mayhew	Slight---	Severe: hard to pack, wetness.	Percs slowly---	Wetness, percs slowly.	Erodes easily, wetness.	Wetness, erodes easily.
42--- McLaurin	Severe: seepage.	Severe: piping.	Deep to water	Droughty, fast intake.	Favorable---	Droughty.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
43---------- Nugent	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, flooding.	Too sandy------	Droughty.
44---------- Ochlockonee	Severe: seepage.	Severe: piping.	Deep to water	Flooding-------	Favorable------	Favorable.
45---------- Oktibbeha	Moderate: slope.	Moderate: hard to pack.	Deep to water	Percs slowly, slope, erodes easily.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
46---------- Oktibbeha	Severe: slope.	Moderate: hard to pack.	Deep to water	Percs slowly, slope, erodes easily.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
47---------- Ora	Moderate: seepage.	Moderate: piping, wetness.	Slope----------	Wetness, droughty, rooting depth.	Erodes easily, wetness.	Erodes easily, droughty.
48---------- Ouachita	Slight---------	Severe: piping.	Deep to water	Erodes easily	Erodes easily	Percs slowly.
49---------- Ouachita	Slight---------	Severe: piping.	Deep to water	Erodes easily, flooding.	Erodes easily	Percs slowly.
50---------- Ozan	Slight---------	Severe: piping.	Percs slowly, flooding.	Wetness, percs slowly, flooding.	Erodes easily, wetness, percs slowly.	Wetness, percs slowly.
51---------- Pikeville	Severe: seepage.	Severe: seepage.	Deep to water	Favorable------	Erodes easily	Erodes easily.
52---------- Pikeville	Severe: seepage.	Severe: seepage.	Deep to water	Slope----------	Erodes easily	Erodes easily.
53---------- Pirum	Moderate: seepage, depth to rock.	Severe: piping.	Deep to water	Depth to rock, slope.	Depth to rock	Depth to rock.
54:						
Pirum----------	Moderate: seepage, depth to rock.	Severe: piping.	Deep to water	Depth to rock, slope.	Depth to rock	Depth to rock.
Sherless---------	Moderate: seepage, depth to rock, slope.	Moderate: thin layer, piping.	Deep to water	Depth to rock, slope.	Large stones, depth to rock.	Large stones, depth to rock.
Shermore---------	Moderate: seepage, slope.	Moderate: piping, wetness.	Slope----------	Wetness, droughty, rooting depth.	Wetness, rooting depth.	Droughty, rooting depth.
55:						
Pirum----------	Moderate: seepage, depth to rock.	Severe: piping.	Deep to water	Depth to rock, slope.	Depth to rock	Depth to rock.
Zafra----------	Moderate: seepage, depth to rock, slope.	Severe: seepage.	Deep to water	Droughty, depth to rock, slope.	Depth to rock	Droughty, depth to rock.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
55: Clebit	Severe: depth to rock, seepage.	Severe: thin layer, large stones.	Deep to water	Large stones, droughty, depth to rock.	Large stones, depth to rock.	Large stones, droughty, depth to rock.
56: Pits.						
Fluvaquents.						
57---------- Sacul	Slight---------	Severe: hard to pack.	Deep to water	Slope, percs slowly, wetness.	Percs slowly, wetness.	Percs slowly.
58, 59---------- Sacul	Slight---------	Severe: hard to pack.	Deep to water	Slope, percs slowly, wetness.	Slope, percs slowly, wetness.	Slope, percs slowly.
60---------- Sacul	Slight---------	Severe: hard to pack.	Deep to water	Slope, percs slowly, wetness.	Percs slowly, wetness.	Percs slowly.
61---------- Sacul	Slight---------	Severe: hard to pack.	Deep to water	Slope, percs slowly, wetness.	Slope, percs slowly, wetness.	Slope, percs slowly.
62: Sacul----------	Slight---------	Severe: hard to pack.	Deep to water	Slope, percs slowly, wetness.	Percs slowly, wetness.	Percs slowly.
Ruston----------	Moderate: seepage, slope.	Severe: thin layer.	Deep to water	Slope----------	Favorable------	Favorable.
63: Sacul----------	Slight---------	Severe: hard to pack.	Deep to water	Slope, percs slowly, wetness.	Slope, percs slowly, wetness.	Slope, percs slowly.
Smithdale--------	Severe: seepage.	Severe: piping.	Deep to water	Slope----------	Slope----------	Slope.
64---------- Saffell	Severe: seepage.	Slight---------	Deep to water	Droughty, slope.	Favorable------	Droughty.
65---------- Saffell	Severe: seepage.	Slight---------	Deep to water	Droughty, slope.	Slope----------	Slope, droughty.
66: Saffell----------	Severe: seepage.	Slight---------	Deep to water	Droughty, slope.	Slope----------	Slope, droughty.
Sacul----------	Slight---------	Severe: hard to pack.	Deep to water	Slope, percs slowly, wetness.	Slope, percs slowly, wetness.	Slope, percs slowly.
67---------- Sardis	Moderate: seepage.	Severe: piping, wetness.	Favorable------	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
68---------- Sardis	Moderate: seepage.	Severe: piping, wetness.	Flooding-------	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
69---------- Savannah	Moderate: seepage.	Severe: piping.	Favorable------	Wetness, droughty, rooting depth.	Wetness, rooting depth.	Rooting depth.
70---------- Savannah	Moderate: seepage.	Severe: piping.	Slope----------	Wetness, rooting depth, slope.	Wetness, rooting depth.	Rooting depth.
71---------- Sawyer	Slight---------	Severe: hard to pack.	Percs slowly---	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Erodes easily, percs slowly.
72---------- Sawyer	Slight---------	Severe: hard to pack.	Percs slowly, slope.	Wetness, percs slowly, slope.	Erodes easily, wetness, percs slowly.	Erodes easily, percs slowly.
73---------- Shermore	Moderate: seepage, slope.	Moderate: piping, wetness.	Slope----------	Wetness, droughty, rooting depth.	Wetness, rooting depth.	Droughty, rooting depth.
74---------- Sherwood	Moderate: seepage, depth to rock, slope.	Moderate: thin layer, piping.	Deep to water	Depth to rock, slope.	Depth to rock	Depth to rock.
75---------- Sherwood	Severe: slope.	Moderate: thin layer, piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock.	Slope, depth to rock.
76---------- Smithdale	Severe: seepage.	Severe: piping.	Deep to water	Slope----------	Favorable------	Favorable.
77:						
Smithdale--------	Severe: seepage.	Severe: piping.	Deep to water	Slope----------	Favorable------	Favorable.
Bowie----------	Moderate: seepage.	Moderate: piping.	Deep to water	Slope----------	Favorable------	Favorable.
Sacul----------	Slight---------	Severe: hard to pack.	Deep to water	Slope, percs slowly, wetness.	Percs slowly, wetness.	Percs slowly.
78---------- Smithton	Slight---------	Severe: piping, wetness.	Favorable------	Wetness--------	Wetness--------	Wetness.
79---------- Stough	Slight---------	Moderate: piping, wetness.	Favorable------	Wetness, droughty.	Erodes easily, wetness.	Wetness, erodes easily, droughty.
80---------- Sumter	Moderate: seepage, depth to rock, slope.	Severe: thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Depth to rock, erodes easily.	Erodes easily, depth to rock.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
81---------- Sumter	Severe: slope.	Severe: thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
82---------- Terouge	Slight---------	Severe: hard to pack, wetness.	Percs slowly---	Wetness, slow intake, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
83---------- Terouge	Slight---------	Severe: hard to pack, wetness.	Percs slowly, flooding.	Wetness, slow intake, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
84---------- Toine	Moderate: seepage.	Severe: piping.	Deep to water	Flooding-------	Favorable------	Favorable.
85---------- Trebloc	Slight---------	Severe: wetness.	Favorable------	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
86---------- Tuscumbia	Slight---------	Severe: hard to pack, wetness.	Percs slowly, flooding.	Wetness, slow intake, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
87: Udorthents.						
88---------- Una	Slight---------	Severe: hard to pack, wetness.	Percs slowly, flooding.	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
89---------- Urbo	Slight---------	Severe: wetness.	Percs slowly, flooding.	Wetness, erodes easily, slow intake.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
90---------- Wilcox	Moderate: depth to rock.	Severe: hard to pack.	Percs slowly---	Wetness, percs slowly.	Erodes easily, wetness.	Erodes easily, percs slowly.
91---------- Wilcox	Moderate: depth to rock.	Severe: hard to pack.	Percs slowly, slope.	Wetness, percs slowly.	Erodes easily, wetness.	Erodes easily, percs slowly.
92---------- Wing Variant	Moderate: depth to rock.	Severe: wetness, excess sodium.	Percs slowly, excess sodium.	Wetness, percs slowly, excess sodium.	Wetness, percs slowly.	Wetness, excess sodium, percs slowly.
93: Yanush----------	Moderate: seepage.	Moderate: large stones.	Deep to water	Droughty, slope, large stones.	Large stones---	Large stones, droughty.
Ceda----------	Severe: seepage.	Severe: seepage.	Deep to water	Flooding, droughty.	Large stones---	Droughty, large stones.
94: Yanush----------	Moderate: seepage.	Moderate: large stones.	Deep to water	Droughty, slope, large stones.	Slope, large stones.	Large stones, slope, droughty.
Carnasaw---------	Severe: slope.	Moderate: thin layer, hard to pack.	Deep to water	Percs slowly, slope.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.

TABLE 15.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Bigfork----------	Severe: slope.	Moderate: large stones.	Deep to water	Droughty, slope.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
95: Yanush----------	Severe: slope.	Moderate: large stones.	Deep to water	Droughty, slope, large stones.	Slope, large stones.	Large stones, slope, droughty.
Bigfork----------	Severe: slope.	Moderate: large stones.	Deep to water	Droughty, slope.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Carnasaw---------	Severe: slope.	Moderate: thin layer, hard to pack.	Deep to water	Percs slowly, slope.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
96: Zafra----------	Severe: slope.	Severe: seepage.	Deep to water	Droughty, depth to rock, slope.	Slope, depth to rock.	Slope, droughty, depth to rock.
Carnasaw---------	Severe: slope.	Moderate: thin layer, hard to pack.	Deep to water	Percs slowly, slope.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
Pirum----------	Moderate: seepage, depth to rock.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock.	Slope, depth to rock.
97: Zafra----------	Severe: slope.	Severe: seepage.	Deep to water	Droughty, depth to rock, slope.	Slope, depth to rock.	Slope, droughty, depth to rock.
Carnasaw---------	Severe: slope.	Moderate: thin layer, hard to pack.	Deep to water	Percs slowly, slope.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
Clebit----------	Severe: depth to rock, slope, seepage.	Severe: thin layer, large stones.	Deep to water	Large stones, droughty, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, droughty.

TABLE 16.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1----------	0-4	Silt loam--------	ML, CL, CL-ML	A-4	0	100	98-100	90-100	84-100	<30	NP-10
Adaton	4-72	Silt loam, silty clay loam, silty clay.	CL, CH	A-6, A-7	0	100	98-100	95-100	84-100	30-52	11-30
2----------	0-21	Silt loam--------	ML	A-4	0	100	95-100	90-100	70-95	<30	NP-5
Amy	21-72	Silt loam, silty clay loam.	CL	A-4, A-6	0	100	95-100	95-100	85-95	25-40	8-20
3----------	0-10	Fine sandy loam	ML, CL-ML, CL	A-4	0	100	85-100	80-90	60-80	<23	NP-10
Avilla	10-72	Loam, clay loam, sandy clay loam.	CL, SC, CL-ML	A-6, A-4	0	100	85-100	80-90	45-80	23-38	7-15
4, 5:											
Bigfork---------	0-5	Very cherty silt loam.	CL, SM-SC, SC, GC	A-2, A-4 A-6	5-20	55-80	30-65	30-65	25-60	22-32	5-15
	5-26	Very cherty silty clay loam, very cherty clay loam, extremely cherty silty clay loam.	CL, SC, GC	A-6, A-7 A-2	5-20	55-80	25-65	25-65	20-60	33-43	12-20
	26-30	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
6, 7----------	0-7	Very shaly loam	GM, GM-GC, SM-SC, SM	A-1, A-2, A-4	0-5	35-70	25-50	20-45	20-40	<30	NP-10
Bismarck	7-14	Extremely shaly silt loam, extremely shaly loam, very shaly silt loam.	GM, GM-GC, SM-SC, SM	A-1, A-2	0-10	25-70	15-50	15-40	12-35	<30	NP-10
	14-20	Weathered bedrock	---	---	---	---	---	---	---	---	---
8----------	0-5	Fine sandy loam	SM, ML	A-4	0	90-100	85-100	80-95	45-55	<20	NP-3
Bonnerdale	5-19	Fine sandy loam, sandy loam.	SM, ML	A-4	0	90-100	85-100	80-95	45-55	<20	NP-3
	19-34	Fine sandy loam, sandy loam, loam.	SM, SM-SC, ML, CL-ML	A-4	0	90-100	85-100	80-95	45-60	<25	NP-8
	34-54	Fine sandy loam, loam, sandy clay loam.	SC, CL	A-4, A-6	0	90-100	85-100	80-95	45-60	20-35	8-15
	54-59	Clay loam, silty clay, shaly clay.	CL, CH, SC GC	A-7	0	70-100	60-100	55-95	40-75	40-60	18-35
	59-75	Weathered bedrock	---	---	---	---	---	---	---	---	---

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
9, 10---------- Bowie	0-17	Fine sandy loam	SM, SM-SC, ML	A-2-4, A-4	0	98-100	98-100	95-100	30-55	<25	NP-6
	17-42	Sandy clay loam, clay loam, fine sandy loam.	SC, CL	A-4, A-6	0	90-100	90-100	85-100	40-72	20-40	8-25
	42-72	Sandy clay loam, clay loam, fine sandy loam.	SC, CL	A-4, A-6, A-7	0	80-100	70-100	65-100	36-77	20-48	8-30
11, 12---------- Cahaba	0-9	Fine sandy loam	SM	A-4, A-2-4	0	95-100	95-100	65-90	30-45	---	NP
	9-41	Sandy clay loam, loam, clay loam.	SC, CL	A-4, A-6	0	90-100	80-100	75-90	40-75	22-35	8-15
	41-72	Sand, loamy sand, fine sandy loam.	SM, SP-SM	A-2-4	0	95-100	90-100	60-85	10-35	---	NP
13: Carnasaw---------	0-4	Gravelly silt loam.	CL, SC	A-4, A-6	0-25	55-75	55-75	45-75	35-75	30-37	8-14
	4-15	Silty clay, clay loam, clay.	CL, CH	A-6, A-7	0-10	85-95	80-95	75-95	70-95	37-65	18-35
	15-51	Clay, silty clay	CL, CH	A-7	0-10	85-95	80-95	80-95	70-95	41-65	18-35
	51-53	Weathered bedrock	---	---	---	---	---	---	---	---	---
Bismarck---------	0-7	Very shaly loam	GM, GM-GC, SM-SC, SM	A-1, A-2, A-4	0-5	35-70	25-50	20-45	20-40	<30	NP-10
	7-14	Extremely shaly silt loam, extremely shaly loam, very shaly silt loam.	GM, GM-GC, SM-SC, SM	A-1, A-2	0-10	25-70	15-50	15-40	12-35	<30	NP-10
	14-20	Weathered bedrock	---	---	---	---	---	---	---	---	---
Sherless---------	0-14	Fine sandy loam	SM, SC, CL ML	A-2, A-4	0-20	75-90	75-90	45-80	25-55	<26	NP-8
	14-31	Clay loam, sandy clay loam, gravelly clay loam.	CL, SC	A-2, A-4, A-6	0-10	70-90	70-90	45-85	25-80	25-40	7-18
	31-33	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
14, 15: Carnasaw---------	0-4	Gravelly silt loam.	CL, SC	A-4, A-6	0-25	55-75	55-75	45-75	35-75	30-37	8-14
	4-15	Silty clay, clay loam, clay.	CL, CH	A-6, A-7	0-10	85-95	80-95	75-95	70-95	37-65	18-35
	15-51	Clay, silty clay	CL, CH	A-7	0-10	85-95	80-95	80-95	70-95	41-65	18-35
	51-53	Weathered bedrock	---	---	---	---	---	---	---	---	---
Bismarck---------	0-7	Very shaly loam	GM, GM-GC, SM-SC, SM	A-1, A-2, A-4	0-5	35-70	25-50	20-45	20-40	<30	NP-10
	7-14	Extremely shaly silt loam, extremely shaly loam, very shaly silt loam.	GM, GM-GC, SM-SC, SM	A-1, A-2	0-10	25-70	15-50	15-40	12-35	<30	NP-10
	14-20	Weathered bedrock	---	---	---	---	---	---	---	---	---

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
14, 15:											
Zafra	0-5	Stony fine sandy loam.	GM, GM-GC	A-2, A-4	15-35	50-90	50-90	35-65	25-45	<24	NP-4
	5-9	Gravelly loam, gravelly fine sandy loam, very gravelly fine sandy loam.	GM, GM-GC	A-2, A-4	0-5	50-75	50-75	35-65	25-45	<26	NP-7
	9-12	Gravelly loam, very gravelly loam.	GM, GM-GC	A-2, A-4	0-5	50-75	50-75	35-65	25-45	<27	NP-7
	12-31	Very gravelly loam, very gravelly clay loam, very gravelly sandy clay loam.	GC, GP-GC, GM, GM-GC	A-1, A-2	0-5	25-50	25-50	15-35	5-25	<37	NP-18
	31-33	Weathered bedrock	---	---	---	---	---	---	---	---	---
	33-35	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
16 Ceda	0-7	Gravelly fine sandy loam.	SM, GM, SM-SC, GM-GC	A-1, A-2, A-4	0-10	35-75	35-75	30-50	13-45	<26	NP-7
	7-72	Very gravelly loam, very gravelly fine sandy loam, extremely cherty clay loam.	GM, GP-GM, GM-GC	A-1, A-2, A-4, A-6	0-30	15-50	15-50	10-50	5-45	<40	NP-18
17 Cuthbert	0-9	Fine sandy loam	SM, SC, ML	A-2-4, A-4	0	85-100	78-100	75-98	20-55	<30	NP-6
	9-29	Sandy clay loam, sandy clay, clay.	SC, CL, CH	A-6, A-7	0	95-100	78-100	75-100	45-98	37-63	20-40
	29-72	Stratified fine sandy loam to very shaly clay.	SC, CL	A-6, A-7, A-2-6, A-2-7	0	89-100	78-100	75-100	28-84	29-45	11-26
18 Darden	0-7	Loamy fine sand	SM, SP-SM	A-2, A-3	0	100	100	90-100	5-35	---	NP
	7-82	Loamy fine sand, loamy sand.	SM, SP-SM	A-2	0	100	100	90-100	11-35	---	NP
19 Demopolis	0-3	Very channery silty clay loam.	GC, GM-GC, GP-GC	A-2, A-1	0	35-55	30-50	20-40	8-15	18-38	4-14
	3-7	Very channery loam, extremely channery loam, extremely channery silty clay loam.	GC, GM-GC, GP-GC	A-2, A-1	0	20-30	3-25	3-20	2-15	18-38	4-14
	7-11	Weathered bedrock	---	---	---	---	---	---	---	---	---
20 Eutaw	0-5	Silty clay loam	CH, MH	A-7	0	100	100	95-100	90-100	51-60	23-32
	5-28	Clay, silty clay	CH, MH	A-7	0	100	100	95-100	80-95	51-100	25-60
	28-72	Clay	CH, MH	A-7	0	100	100	95-100	80-95	51-100	25-60

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
21---------- Foley	0-5	Silt loam--------	CL, CL-ML	A-4, A-6, A-7	0	100	100	95-100	70-100	25-45	5-20
	5-23	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	90-100	30-49	11-25
	23-72	Silty clay loam, silt loam.	CL, CH	A-7	0	100	100	95-100	90-100	40-60	18-32
22, 23---------- Gurdon	0-4	Silt loam--------	ML, CL-ML	A-4	0	100	95-100	90-100	70-90	<18	NP-5
	4-30	Silt loam, very fine sandy loam, loam.	ML, CL-ML, CL	A-4	0	100	95-100	90-100	75-90	<20	NP-10
	30-72	Silt loam, loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	100	95-100	90-100	75-90	18-30	5-15
24---------- Guyton	0-5	Silt loam--------	ML, CL-ML	A-4	0	100	100	95-100	65-90	<27	NP-7
	5-23	Silt loam, loam, very fine sandy loam.	ML, CL-ML, CL	A-4	0	100	95-100	90-100	75-90	<20	NP-10
	23-44	Silt loam, silty clay loam, clay loam.	CL, CL-ML	A-6, A-4	0	100	100	94-100	75-95	22-40	6-18
	44-72	Silt loam, silty clay loam, sandy clay loam.	CL, CL-ML, ML	A-6, A-4	0	100	100	95-100	50-95	<40	NP-18
25---------- Guyton	0-5	Silt loam--------	ML, CL-ML	A-4	0	100	100	95-100	65-90	<27	NP-7
	5-23	Silt loam, loam, very fine sandy loam.	ML, CL-ML, CL	A-4	0	100	95-100	90-100	75-90	<20	NP-10
	23-44	Silt loam, silty clay loam, clay loam.	CL, CL-ML	A-6, A-4	0	100	100	94-100	75-95	26-40	6-18
	44-72	Silt loam, silty clay loam, clay loam.	CL, CL-ML, ML	A-6, A-4	0	100	100	95-100	65-95	<40	NP-18
26---------- Harleston	0-4	Fine sandy loam	ML, SM, CL-ML, SM-SC	A-2, A-4	0	90-100	85-100	60-85	30-55	<25	NP-7
	4-36	Sandy loam, loam, fine sandy laom.	SC, CL, CL-ML, SM-SC	A-2, A-4	0	90-100	85-100	60-95	30-70	20-30	5-10
	36-72	Sandy loam, loam, sandy clay loam.	SC, CL, CL-ML, SM-SC	A-2, A-4, A-6	0	90-100	85-100	60-95	30-70	20-35	5-13
27, 28---------- Houston	0-20	Clay----------	CH, MH	A-7	0	100	100	95-100	90-95	50-68	23-37
	20-31	Clay----------	CH, MH	A-7	0	100	100	95-100	95-98	51-75	25-43
	31-72	Clay----------	CH, MH	A-7	0	100	100	95-100	95-98	55-80	30-45
29---------- Iuka	0-13	Fine sandy loam	SM, SM-SC, ML, CL-ML	A-4, A-2	0	95-100	90-100	70-100	30-60	<20	NP-7
	13-45	Fine sandy loam, loam, sandy loam.	SM, SM-SC, ML, CL-ML	A-4	0	95-100	85-100	65-100	36-75	<30	NP-7
	45-72	Sandy loam, fine sandy loam, loam.	SM, ML	A-2, A-4	0	95-100	90-100	70-100	25-60	<30	NP-7

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
30---------- Kenn	0-8	Fine sandy loam	ML, SM, CL-ML, SM-SC	A-2, A-4	0	75-90	75-90	65-90	25-55	<26	NP-7
	8-28	Clay loam, sandy clay loam, gravelly clay loam.	CL, SC	A-2, A-4, A-6	0-15	50-90	50-90	35-90	15-80	25-40	8-18
	28-41	Very gravelly sandy clay loam, very gravelly clay loam.	GC, GP-GC	A-2, A-4, A-6	0-30	25-50	25-50	20-50	10-45	25-40	8-18
	41-72	Extremely gravelly loam, extremely gravelly fine sandy loam, extremely gravelly sandy clay loam.	GC, GM, GP-GC, GP-GM	A-1, A-2, A-4	15-65	15-50	15-50	10-50	5-45	<31	NP-10
31---------- Kipling	0-5	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	90-100	70-90	<30	NP-10
	5-45	Silty clay, clay, silty clay loam.	CH, CL	A-7, A-6	0	100	100	95-100	85-95	38-70	22-45
	45-72	Clay, silty clay	CH, CL	A-7	0	100	100	90-100	75-95	48-80	26-50
32---------- Kipling	0-5	Silty clay loam	CL	A-6, A-7	0	100	100	95-100	85-95	30-45	15-25
	5-45	Silty clay, clay, silty clay loam.	CH, CL	A-7, A-6	0	100	100	95-100	85-95	38-70	22-45
	45-72	Clay, silty clay	CH, CL	A-7	0	100	100	90-100	75-95	48-80	26-50
33---------- Kirkville	0-7	Fine sandy loam	ML, SM, CL-ML, SM-SC	A-2, A-4	0	100	100	60-85	30-65	<20	NP-5
	7-72	Loam, sandy loam, fine sandy loam.	ML, SM, CL-ML, SM-SC	A-2, A-4	0	100	100	60-100	30-65	<20	NP-5
34---------- Leeper	0-8	Silty clay-------	CH, MH	A-7	0	100	100	90-100	80-95	55-70	30-45
	8-72	Clay, silty clay.	CH, MH	A-7	0	100	100	95-100	80-97	52-75	30-50
35, 36---------- Macon	0-7	Fine sandy loam	SM, ML	A-4	0	98-100	90-100	70-95	40-75	<30	NP-4
	7-26	Clay loam, sandy clay loam, loam.	CL, SC	A-6	0	98-100	95-100	80-95	45-75	30-40	11-17
	26-72	Clay loam, sandy clay loam, sandy clay.	SC, CL	A-6, A-7	0	95-100	90-100	80-100	45-70	30-45	12-23
37---------- Magnet	0-8	Loam-------------	CL-ML, CL	A-4	0-5	80-100	75-100	65-85	60-80	<30	5-10
	8-31	Clay, gravelly clay, cobbly silty clay loam.	CH, GC, SC	A-7	0-20	60-100	55-100	50-85	45-80	60-80	30-50
	31-72	Weathered bedrock	---	---	---	---	---	---	---	---	---
38, 39---------- Magnet	0-8	Stony loam-------	CL-ML, CL, GM-GC, GC	A-4	10-25	60-80	55-75	50-70	45-65	<30	5-10
	8-31	Clay, gravelly clay, cobbly silty clay loam.	CH, GC, SC	A-7	0-20	60-100	55-100	50-85	45-80	60-80	30-50
	31-72	Weathered bedrock	---	---	---	---	---	---	---	---	---

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
40---------- Marietta	0-11	Fine sandy loam	CL, CL-ML, SM-SC	A-4	0	100	100	80-95	40-75	20-30	5-10
	11-36	Silty clay loam, sandy clay loam, loam.	CL, SC	A-6, A-4	0	100	100	85-100	45-90	25-40	8-20
	36-72	Silty clay loam, sandy clay, clay loam.	CL, CH, SC	A-7, A-6	0	100	100	85-100	45-90	35-55	15-30
41---------- Mayhew	0-3	Silty clay loam	CL	A-6, A-7	0	100	100	90-100	70-95	36-50	15-28
	3-50	Silty clay loam, silty clay, clay.	CH, CL	A-7	0	100	100	95-100	85-95	46-75	25-50
	50-63	Silty clay, clay, silty clay loam.	CH, CL	A-7	0	100	90-100	90-100	75-90	45-80	25-50
	63-72	Weathered bedrock	---	---	---	---	---	---	---	---	---
42---------- McLaurin	0-9	Loamy fine sand, sandy loam.	SM	A-2	0	90-100	90-100	50-75	15-30	<20	NP-4
	9-48	Sandy loam, fine sandy loam, loam.	SM, SC, SM-SC	A-4	0	90-100	90-100	85-95	36-45	<30	NP-10
	48-66	Loamy fine sand, sandy loam.	SM	A-2	0	90-100	90-100	50-75	15-30	<20	NP-4
	66-72	Sandy loam, sandy clay loam, loam.	SC, ML, CL SM	A-4, A-6	0	90-100	90-100	70-80	36-55	30-40	6-15
43---------- Nugent	0-5	Loamy fine sand	SM, SP-SM	A-2	0	85-100	75-100	50-100	10-30	NP	NP
	5-72	Stratified loamy sand to fine sandy loam.	SM, SP-SM	A-2	0	85-100	75-100	60-100	10-30	<25	NP-3
44---------- Ochlockonee	0-12	Fine sandy loam	SM, ML, SM-SC, CL-ML	A-4, A-2	0	100	95-100	65-90	40-70	<26	NP-5
	12-44	Fine sandy loam, sandy loam, silt loam.	SM, ML, SC CL	A-4	0	100	95-100	95-100	36-75	<32	NP-9
	44-72	Loamy sand, sandy loam, silt loam.	SM, ML, CL SC	A-4, A-2	0	100	95-100	85-99	13-80	<32	NP-9
45, 46---------- Oktibbeha	0-3	Fine sandy loam	ML, SM	A-4	0	100	90-100	65-85	40-60	<30	NP-7
	3-43	Clay----------	CH	A-7	0	100	95-100	95-100	95-100	55-65	30-40
	43-49	Clay, silty clay	CL	A-7	0-5	95-100	90-100	90-100	90-100	41-49	25-30
47---------- Ora	0-4	Fine sandy loam	SM-SC, SM, ML, CL-ML	A-4, A-2	0	100	95-100	65-85	30-65	<30	NP-5
	4-8	Fine sandy loam, loam.	SC, CL, CL-ML, SM-SC	A-2, A-4	0	100	95-100	70-90	30-70	20-30	5-10
	8-29	Clay loam, sandy clay loam, loam.	CL	A-6, A-4, A-7	0	100	95-100	80-100	50-80	25-48	8-22
	29-72	Sandy clay loam, loam, sandy loam.	CL	A-6, A-7, A-4	0	100	95-100	80-100	50-75	25-43	8-25
48, 49---------- Ouachita	0-6	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	100	100	85-100	75-95	<30	NP-12
	6-72	Silt loam, loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6	0	100	100	85-100	80-100	25-40	5-20

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
50---------- Ozan	0-7	Fine sandy loam, loam, sandy loam.	SM, ML	A-4	0	95-100	95-100	90-100	40-75	<20	NP-3
	7-17	Fine sandy loam	SM, ML	A-4	0	95-100	95-100	90-100	40-75	<20	NP-3
	17-39	Loam, sandy loam	ML, CL-ML, CL	A-4	0	95-100	95-100	90-100	51-80	<30	NP-10
	39-72	Loam, sandy clay loam, sandy loam.	CL, CL-ML, ML	A-4, A-6	0	95-100	95-100	90-100	51-85	<35	NP-18
51, 52---------- Pikeville	0-4	Fine sandy loam	SM, ML	A-4	0	90-100	90-100	50-85	36-60	<30	NP-4
	4-11	Sandy clay loam, loam, gravelly clay loam.	SC, CL, SM-SC, CL-ML	A-4, A-6	0	80-100	65-100	60-90	36-60	20-40	4-17
	11-35	Gravelly sandy clay loam, gravelly loam, very gravelly sandy clay loam.	SC, SM, GM	A-1-B, A-2, A-4 A-6	0	60-90	45-75	45-75	20-45	25-48	2-18
	35-72	Gravelly loam, extremely gravelly loam, very gravelly sandy clay loam.	GW-GM, GM, SW-SM, SM	A-1, A-2	0-5	35-75	10-75	10-55	9-30	20-45	2-16
53---------- Pirum	0-10	Fine sandy loam	SM, ML	A-4	0	75-100	75-100	70-90	35-65	<20	NP-3
	10-42	Sandy clay loam, gravelly clay loam, loam.	CL, CL-ML	A-4, A-6	0	75-100	55-100	55-90	50-70	22-35	5-15
	42-44	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
54: Pirum----------	0-10	Fine sandy loam	SM, ML	A-4	0	75-100	75-100	70-90	35-65	<20	NP-3
	10-42	Sandy clay loam, gravelly clay loam, loam.	CL, CL-ML	A-4, A-6	0	75-100	55-100	55-90	50-70	22-35	5-15
	42-44	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Sherless--------	0-14	Fine sandy loam	SM, SC, CL ML	A-2, A-4	0-20	75-90	75-90	45-80	25-55	<26	NP-8
	14-31	Clay loam, sandy clay loam, gravelly clay loam.	CL, SC	A-2, A-4, A-6	0-10	70-90	70-90	45-85	25-80	25-40	7-18
	31-33	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Shermore--------	0-4	Fine sandy loam	SM, ML, CL-ML, SM-SC	A-4, A-2	0	75-98	75-98	60-85	25-60	<26	NP-7
	4-20	Sandy clay loam, clay loam, loam.	CL, SC	A-4, A-6, A-2	0	75-98	75-98	60-90	25-90	25-40	8-18
	20-49	Sandy clay loam, clay loam, loam.	CL, SC	A-4, A-6, A-2	0	85-98	75-98	70-90	30-90	25-40	8-18
	49-71	Fine sandy loam, loam, sandy clay loam.	SC,SC-SM CL, CL-ML	A-2, A-4, A-6	0	75-98	75-98	60-85	25-90	25-40	6-18
	71-73	Weathered bedrock	---	---	---	---	---	---	---	---	---

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
55:											
Pirum	0-10	Gravelly fine sandy loam.	SM, ML	A-4	0	55-75	60-80	50-70	40-60	<20	NP-3
	10-42	Sandy clay loam, gravelly clay loam, loam.	CL, CL-ML	A-4, A-6	0	55-100	55-100	70-90	50-70	22-35	5-15
	42-44	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Zafra	0-5	Stony fine sandy loam.	GM, GM-GC	A-2, A-4	15-35	50-90	50-90	35-65	25-45	<24	NP-4
	5-9	Gravelly loam, gravelly fine sandy loam, very gravelly fine sandy loam.	GM, GM-GC	A-2, A-4	0-5	50-75	50-75	35-65	25-45	<26	NP-7
	9-12	Gravelly loam very gravelly loam.	GM, GM-GC	A-2, A-4	0-5	50-75	50-75	35-65	25-45	<27	NP-7
	12-31	Very gravelly loam, very gravelly clay loam, very gravelly sandy clay loam.	GC, GP-GC, GM, GM-GC	A-1, A-2	0-5	25-50	25-50	15-35	5-25	<37	NP-18
	31-33	Weathered bedrock	---	---	---	---	---	---	---	---	---
	33-35	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Clebit	0-6	Stony fine sandy loam.	GM, GM-GC	A-1, A-2	15-40	35-50	35-60	30-50	13-30	<26	NP-7
	6-17	Very gravelly fine sandy loam, very gravelly loam.	GM, GC, GM-GC	A-1, A-2, A-4, A-6	0-15	35-50	35-50	30-50	13-45	<35	NP-13
	17-19	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
56:											
Pits.											
Fluvaquents.											
57, 58, 59	0-8	Fine sandy loam	SM, ML	A-4	0	95-100	90-100	80-100	40-65	<20	NP-3
Sacul	8-55	Clay, silty clay	CH, CL	A-7	0	95-100	90-100	85-95	80-90	45-70	20-40
	55-72	Silty clay loam, silt loam, clay loam.	CL, CH, SC	A-6, A-7, A-4	0	95-100	90-100	85-100	40-90	25-55	8-32
60, 61	0-8	Gravelly fine sandy loam.	SM, ML	A-4	0	75-100	70-100	60-90	40-60	<20	NP-3
Sacul	8-55	Clay, silty clay	CH, CL	A-7	0	95-100	90-100	85-95	80-90	45-70	20-40
	55-72	Silty clay loam, silt loam, clay loam.	CL, CH, SC	A-6, A-7, A-4	0	95-100	90-100	85-100	40-90	25-55	8-32

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
62:											
Sacul	0-8	Fine sandy loam	SM, ML	A-4	0	95-100	90-100	80-100	40-65	<20	NP-3
	8-55	Clay, silty clay	CH, CL	A-7	0	95-100	90-100	85-95	80-90	45-70	20-40
	55-72	Silty clay loam, silt loam, clay loam.	CL, CH, SC	A-6, A-7, A-4	0	95-100	90-100	85-100	40-90	25-55	8-32
Ruston	0-13	Fine sandy loam	SM, ML	A-4, A-2-4	0	85-100	78-100	65-100	30-75	<20	NP-3
	13-25	Sandy clay loam, loam, clay loam.	SC, CL	A-6	0	85-100	78-100	70-100	36-75	30-40	11-20
	25-30	Fine sandy loam, sandy loam, loamy sand.	SM, ML, CL-ML, SM-SC	A-4, A-2-4	0	85-100	78-100	65-100	30-75	<27	NP-7
	30-72	Sandy clay loam, loam, clay loam.	SC, CL	A-6	0	85-100	78-100	70-100	36-75	30-42	11-20
63:											
Sacul	0-8	Fine sandy loam	SM, ML	A-4	0	95-100	90-100	80-100	40-65	<20	NP-3
	8-55	Clay, silty clay	CH, CL	A-7	0	95-100	90-100	85-95	80-90	45-70	20-40
	55-72	Silty clay loam, silt loam, clay loam.	CL, CH, SC	A-6, A-7, A-4	0	95-100	90-100	85-100	40-90	25-55	8-32
Smithdale	0-7	Fine sandy loam	SM, SM-SC	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
	7-42	Clay loam, sandy clay loam, loam.	SM-SC, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-96	45-75	23-38	7-16
	42-72	Loam, sandy loam	SM, ML, CL SC	A-4	0	100	85-100	65-95	36-70	<30	NP-10
64, 65 Saffell	0-6	Gravelly fine sandy loam.	SM	A-1, A-2, A-4	0-5	70-80	50-75	40-65	20-40	<20	NP-3
	6-11	Gravelly fine sandy loam, gravelly sandy clay loam, very gravelly loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-70	20-55	15-35	20-40	4-18
	11-57	Very gravelly sandy clay loam, very gravelly fine sandy loam, very gravelly loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-55	20-55	15-35	20-40	4-18
	57-72	Very gravelly sandy loam, extremely gravelly sandy loam.	GM, GC, SM SC	A-1, A-2, A-3	0-5	25-40	10-35	5-35	5-35	<35	NP-15

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
66:											
Saffell---------	0-6	Gravelly fine sandy loam.	SM	A-1, A-2, A-4	0-5	70-80	50-75	40-65	20-40	<20	NP-3
	6-11	Gravelly fine sandy loam, gravelly sandy clay loam, gravelly loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-70	20-55	15-35	20-40	4-18
	11-57	Very gravelly sandy clay loam, very gravelly fine sandy loam, very gravelly loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-55	20-55	15-35	20-40	4-18
	57-72	Very gravelly sandy loam, extremely gravelly sandy loam.	GM, GC, SM SC	A-1, A-2, A-3	0-5	25-40	10-35	5-35	5-35	<35	NP-15
Sacul----------	0-8	Gravelly fine sandy loam.	SM, ML	A-4	0	75-100	70-100	60-90	40-60	<20	NP-3
	8-55	Clay, silty clay	CH, CL	A-7	0	95-100	90-100	85-95	80-90	45-70	20-40
	55-72	Silty clay loam, silt loam, clay loam.	CL, CH, SC	A-6, A-7, A-4	0	95-100	90-100	85-100	40-90	25-55	8-32
67, 68---------- Sardis	0-6	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	80-100	75-95	<30	NP-10
	6-65	Silt loam, silty clay loam, clay loam.	CL, CL-ML	A-4, A-6	0	100	100	85-100	80-100	25-40	5-20
	65-72	Loam, silt loam, sandy loam.	ML, SM, CL SC	A-4	0	100	95-100	60-95	35-75	<30	NP-10
69, 70---------- Savannah	0-8	Fine sandy loam	SM, ML	A-2-4, A-4	0	100	100	60-85	30-55	<25	NP-4
	8-25	Sandy clay loam, clay loam, loam.	CL, SC, CL-ML	A-4, A-6	0	100	100	80-100	40-80	23-40	7-19
	25-72	Loam, clay loam, sandy clay loam.	CL, SC, CL-ML	A-4, A-6, A-7	0	100	100	80-100	40-80	23-43	7-19
71, 72---------- Sawyer	0-5	Loam----------	ML, CL-ML	A-4	0	100	95-100	85-95	60-90	<25	NP-7
	5-29	Silty clay loam, loam, silt loam.	CL	A-6, A-4	0	100	95-100	85-95	70-90	30-40	10-20
	29-72	Silty clay, clay	CH, CL	A-7	0	100	95-100	90-100	80-90	45-60	20-35
73---------- Shermore	0-4	Fine sandy loam	SM, ML, CL-ML, SM-SC	A-4, A-2	0	75-98	75-98	60-85	25-60	<26	NP-7
	4-20	Sandy clay loam, clay loam, loam.	CL, SC	A-4, A-6, A-2	0	75-98	75-98	60-90	25-90	25-40	8-18
	20-71	Sandy clay loam, clay loam, loam.	CL, SC	A-4, A-6, A-2	0	85-98	75-98	70-90	30-90	25-40	8-18
	71-73	Weathered bedrock.	---	---	---	---	---	---	---	---	---

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
74, 75---------- Sherwood	0-13	Fine sandy loam	SM, SM-SC, ML, CL-ML	A-2, A-4	0	100	75-100	60-100	25-60	<25	NP-7
	13-34	Loam, clay loam, sandy clay loam.	CL, SC	A-4, A-6	0	70-97	65-97	60-90	45-65	25-40	8-18
	34-45	Gravelly clay loam, gravelly loam, gravelly sandy clay loam.	SC	A-4, A-6	0	55-75	50-75	45-70	36-50	25-40	8-18
	45-47	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
76---------- Smithdale	0-7	Fine sandy loam	SM, SM-SC	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
	7-42	Clay loam, sandy clay loam, loam.	SM-SC, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-96	45-75	23-38	7-16
	42-72	Loam, sandy loam	SM, ML, CL SC	A-4	0	100	85-100	65-95	36-70	<30	NP-10
77:											
Smithdale-------	0-7	Fine sandy loam	SM, SM-SC	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
	7-42	Clay loam, sandy clay loam, loam.	SM-SC, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-96	45-75	23-38	7-16
	42-72	Loam, sandy loam	SM, ML, CL SC	A-4	0	100	85-100	65-95	36-70	<30	NP-10
Bowie----------	0-17	Fine sandy loam	SM, SM-SC, ML	A-2-4, A-4	0	98-100	98-100	95-100	30-55	<25	NP-6
	17-42	Sandy clay loam, clay loam, fine sandy loam.	SC, CL	A-4, A-6	0	90-100	90-100	85-100	40-72	20-40	8-25
	42-72	Sandy clay loam, clay loam, fine sandy loam.	SC, CL	A-4, A-6, A-7	0	80-100	70-100	65-100	36-77	20-48	8-30
Sacul----------	0-8	Fine sandy loam	SM, ML	A-4	0	95-100	90-100	80-100	40-65	<20	NP-3
	8-55	Clay, silty clay	CH, CL	A-7	0	95-100	90-100	85-95	80-90	45-70	20-40
	55-72	Silty clay loam, silt loam, clay loam.	CL, CH, SC	A-6, A-7, A-4	0	95-100	90-100	85-100	40-90	25-55	8-32
78---------- Smithton	0-5	Very fine sandy loam.	SM, ML, CL-ML	A-2, A-4	0	95-100	95-100	60-98	30-65	<25	NP-7
	5-50	Fine sandy loam, loam.	ML, CL-ML	A-4	0	95-100	95-100	85-95	55-80	15-25	2-7
	50-72	Fine sandy loam, loam, sandy clay loam.	CL-ML, CL	A-4, A-6	0	95-100	95-100	90-100	60-90	20-30	5-15
79---------- Stough	0-3	Fine sandy loam	SM-SC, SM, ML, CL-ML	A-4	0	100	100	65-85	35-65	<25	NP-7
	3-8	Loam, fine sandy loam.	ML, CL, CL-ML	A-4	0	100	100	75-95	50-75	<25	NP-8
	8-72	Sandy loam, sandy clay loam, loam.	SC, CL	A-4, A-6	0	100	100	65-90	40-65	25-40	8-15
80, 81---------- Sumter	0-3	Silty clay-------	CL	A-7, A-6	0	90-100	85-100	80-98	75-90	35-50	16-25
	3-31	Silty clay, clay, silty clay loam.	CH, CL	A-7, A-6	0	85-100	78-98	75-95	75-95	35-55	16-32
	31-33	Weathered bedrock	---	---	---	---	---	---	---	---	---
82, 83---------- Terouge	0-22	Silty clay-------	CH	A-7	0	100	95-100	95-100	80-100	60-90	35-60
	22-72	Silty clay, clay	CH	A-7	0	100	95-100	95-100	80-100	60-90	35-60

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
84----------	0-13	Fine sandy loam	ML, SM	A-4	0	85-100	75-100	90-100	45-70	<20	NP
Toine	13-58	Sandy clay loam, loam.	ML, CL, SC CL-ML	A-4, A-6	0	85-100	75-100	90-100	45-80	17-35	3-17
	58-72	Fine sandy loam, sandy clay loam, loam.	ML, CL, SM SC	A-4	0	85-100	75-100	90-100	45-85	<30	NP-10
85----------	0-6	Silt loam--------	ML, CL-ML	A-4	0	100	100	85-100	60-90	<30	NP-7
Trebloc	6-61	Silt loam, silty clay loam.	CL	A-4, A-6	0	100	100	85-100	85-100	25-40	8-16
	61-72	Silty clay loam, silty clay,	CL	A-4, A-6, A-7	0	100	100	85-100	85-100	25-48	8-21
86----------	0-7	Silty clay-------	CL	A-7, A-6	0	100	100	90-100	75-90	35-50	15-25
Tuscumbia	7-72	Clay, silty clay, silty clay loam.	CH	A-7	0	100	100	95-100	80-95	51-75	30-50
87: Udorthents.											
88----------	0-6	Silty clay loam	CH, CL	A-7	0	100	100	90-100	75-95	41-65	20-40
Una	6-72	Clay, silty clay loam, silty clay.	CH, CL	A-7	0	100	100	90-100	75-95	41-65	20-40
89----------	0-4	Silty clay loam	CL	A-6	0	100	100	95-100	95-100	30-40	15-25
Urbo	4-72	Silty clay, clay loam, clay.	CL, CH	A-7	0	100	100	95-100	80-98	44-62	20-36
90, 91----------	0-4	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	95-100	80-95	20-30	5-15
Wilcox	4-52	Clay, silty clay, silty clay loam.	CH	A-7	0	100	100	95-100	80-95	50-72	28-46
	52-62	Clay, silty clay.	CH	A-7	0	100	100	90-100	75-95	60-80	39-55
	62-72	Weathered bedrock	---	---	---	---	---	---	---	---	---
92----------	0-10	Fine sandy loam	ML, SM	A-4	0	85-100	80-95	65-80	40-65	<25	NP-3
Wing Variant	10-20	Loam, silty clay loam, clay loam.	CL, SC	A-6	0	85-100	80-95	60-85	40-75	20-35	11-20
	20-45	Clay loam, silty clay loam, silty clay.	CL, CH	A-7	0	85-100	80-95	70-90	50-85	35-55	20-35
	45-50	Weathered bedrock	---	---	---	---	---	---	---	---	---
93:											
Yanush----------	0-15	Very cherty silt loam.	GC, GM	A-2, A-4, A-6	0-10	45-75	25-50	20-45	15-40	22-35	2-14
	15-65	Very cherty clay loam, very cherty silty clay loam, extremely cherty silty clay loam.	GC, CL	A-6, A-7, A-2	20-35	20-60	15-60	15-60	15-55	33-43	12-20
	65-72	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
93:											
Ceda----------	0-7	Very cherty fine sandy loam.	SM, GM, ML GM-GC	A-1, A-2, A-4	0-10	35-75	35-75	35-65	20-65	22-29	2-7
	7-72	Very gravelly loam, very gravelly fine sandy loam, extremely cherty clay loam.	GM, GP-GM, GM-GC	A-1, A-2, A-4, A-6	0-30	15-50	15-50	10-50	5-45	<40	NP-18
94:											
Yanush----------	0-15	Very cherty silt loam.	GC, GM	A-2, A-4, A-6	0-10	45-75	25-50	20-45	15-40	22-35	2-14
	15-65	Very cherty clay loam, very cherty silty clay loam.	GC, CL	A-6, A-7, A-2	20-35	20-60	15-60	15-60	15-55	33-43	12-20
	65-72	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Carnasaw--------	0-4	Cherty silt loam	CL, SC	A-4, A-6	0-25	55-75	55-75	45-75	35-75	30-37	8-14
	4-15	Silty clay loam, clay loam, clay.	CL, CH	A-6, A-7	0-10	85-95	85-95	75-95	70-95	37-65	18-35
	15-51	Clay, silty clay	CL, CH	A-7	0-10	85-95	85-95	80-95	70-95	41-65	18-35
	51-53	Weathered bedrock	---	---	---	---	---	---	---	---	---
Bigfork---------	0-5	Very cherty silt loam.	CL, SM-SC, SC, GC	A-2, A-4, A-6	5-20	55-80	30-65	30-65	25-60	22-32	5-15
	5-26	Very cherty silty clay loam, very cherty clay loam, extremely cherty silty clay loam.	CL, SC, GC	A-2, A-6, A-7	5-20	55-80	25-65	25-65	20-60	33-43	12-20
	26-30	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
95:											
Yanush----------	0-15	Very cherty silt loam.	GC, GM	A-2, A-4, A-6	0-10	45-75	25-50	20-45	15-40	22-35	2-14
	16-70	Very cherty clay loam, very cherty silty clay loam.	GC, CL	A-6, A-7, A-2	20-35	20-60	15-60	15-60	15-55	33-43	12-20
Bigfork---------	0-5	Very cherty silt loam.	CL, SM-SC, SC, GC	A-2, A-4, A-6	5-20	55-80	30-65	30-65	25-60	22-32	5-15
	5-26	Very cherty silty clay loam, very cherty clay loam, extremely cherty silty clay loam.	CL, SC, GC	A-2, A-6 A-7	5-20	55-80	25-65	25-65	20-60	33-43	12-20
	26-30	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Carnasaw--------	0-4	Cherty silt loam	CL, SC	A-4, A-6	0-25	55-75	55-75	45-75	35-75	30-37	8-14
	4-15	Silty clay, clay loam, clay.	CL, CH	A-6, A-7	0-10	85-95	80-95	75-95	70-95	37-65	18-35
	15-51	Clay, silty clay	CL, CH	A-7	0-10	85-95	80-95	80-95	70-95	41-65	18-35
	51-53	Weathered bedrock	---	---	---	---	---	---	---	---	---

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
96:											
Zafra	0-5	Stony fine sandy loam.	GM, GM-GC	A-2, A-4	15-35	50-90	50-90	35-65	25-45	<24	NP-4
	5-9	Gravelly loam, gravelly fine sandy loam, very gravelly fine sandy loam.	GM, GM-GC	A-2, A-4	0-5	50-75	50-75	35-65	25-45	<26	NP-7
	9-12	Gravelly loam, very gravelly loam.	GM, GM-GC	A-2, A-4	0-5	50-75	50-75	35-65	25-45	<27	NP-7
	12-31	Very gravelly loam, very gravelly clay loam, very gravelly sandy clay loam.	GC, GP-GC, GM, GM-GC	A-1, A-2	0-5	25-50	25-50	15-35	5-25	<37	NP-18
	31-33	Weathered bedrock	---	---	---	---	---	---	---	---	---
	33-35	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Carnasaw	0-4	Gravelly silt loam.	CL, SC	A-4, A-6	0-25	55-75	55-75	45-75	35-75	30-37	8-14
	4-15	Silty clay, clay loam, clay.	CL, CH	A-6, A-7	0-10	85-95	80-95	75-95	70-95	37-65	18-35
	15-51	Clay, silty clay	CL, CH	A-7	0-10	85-95	80-95	80-95	70-95	41-65	18-35
	51-53	Weathered bedrock	---	---	---	---	---	---	---	---	---
Pirum	0-10	Gravelly fine sandy loam.	SM, ML	A-4	0	75-100	55-75	50-70	40-60	<20	NP-3
	10-42	Sandy clay loam, gravelly clay, loam, loam.	CL, CL-ML	A-4, A-6	0	75-100	55-100	55-90	50-70	22-35	5-15
	42-44	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
97:											
Zafra	0-5	Stony fine sandy loam.	GM, GM-GC	A-2, A-4	15-35	50-90	50-90	35-65	25-45	<24	NP-4
	5-9	Gravelly loam, gravelly fine sandy loam, very gravelly fine sandy loam.	GM, GM-GC	A-2, A-4	0-5	50-75	50-75	35-65	25-45	<26	NP-7
	9-12	Gravelly loam very gravelly loam.	GM, GM-GC	A-2, A-4	0-5	50-75	50-75	35-65	25-45	<27	NP-7
	12-31	Very gravelly loam, very gravelly clay loam, very gravelly sandy clay loam.	GC, GP-GC, GM, GM-GC	A-1, A-2	0-5	25-50	25-50	15-35	5-25	<37	NP-18
	31-33	Weathered bedrock	---	---	---	---	---	---	---	---	---
	33-35	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
97:											
Carnasaw--------	0-4	Gravelly silt loam.	CL, SC	A-4, A-6	0-25	55-75	55-75	45-75	35-75	30-37	8-14
	4-15	Silty clay, clay loam, clay.	CL, CH	A-6, A-7	0-10	85-95	80-95	75-95	70-95	37-65	18-35
	15-51	Clay, silty clay	CL, CH	A-7	0-10	85-95	80-95	80-95	70-95	41-65	18-35
	51-53	Weathered bedrock	---	---	---	---	---	---	---	---	---
Clebit----------	0-6	Stony fine sandy loam.	GM, GM-GC	A-1, A-2	15-40	35-50	35-60	30-50	13-30	<26	NP-7
	6-17	Very gravelly, fine sandy loam, very gravelly loam.	GM, GC, GM-GC	A-1, A-2, A-4, A-6	0-15	35-50	35-50	30-50	13-45	<35	NP-13
	17-19	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cc	In/hr	In/in	pH				Pct
1----------	0-4	10-16	1.50-1.55	0.6-2.0	0.20-0.22	4.5-5.5	Low----------	0.43	5	1-3
Adaton	4-72	20-42	1.40-1.45	0.06-0.2	0.18-0.22	4.5-5.5	Moderate-----	0.32		
2----------	0-21	15-25	1.25-1.60	0.6-2.0	0.13-0.24	4.5-5.5	Low----------	0.43	5	.5-2
Amy	21-72	20-32	1.25-1.50	0.06-0.2	0.16-0.24	4.5-5.5	Low----------	0.43		
3----------	0-10	15-20	1.30-1.50	0.6-2.0	0.10-0.24	4.5-6.5	Low----------	0.24	4	.5-1
Avilla	10-72	20-35	1.25-1.50	0.6-2.0	0.12-0.20	4.5-5.5	Low----------	0.28		
4, 5:										
Bigfork---------	0-5	20-26	1.30-1.55	0.6-2.0	0.02-0.16	5.1-6.5	Low----------	0.32	2	.5-2
	5-26	27-35	1.45-1.70	0.6-2.0	0.02-0.14	4.5-6.0	Low----------	0.28		
	26-30	---	---	---	---	---	----------	----		
Rock outcrop.										
6, 7----------	0-7	10-18	1.30-1.50	0.6-2.0	0.07-0.13	4.5-6.0	Low----------	0.28	1	.5-2
Bismarck	7-14	12-20	1.30-1.50	0.6-2.0	0.03-0.13	4.5-6.0	Low----------	0.28		
	14-20	---	---	---	---	---	----------	----		
8----------	0-5	5-12	1.50-1.60	2.0-6.0	0.11-0.13	3.6-5.5	Low----------	0.28	4	1-4
Bonnerdale	5-19	8-15	1.50-1.55	2.0-6.0	0.11-0.13	3.6-5.5	Low----------	0.28		
	19-34	10-18	1.45-1.55	2.0-6.0	0.11-0.18	3.6-5.5	Low----------	0.28		
	34-54	15-30	1.40-1.50	0.6-2.0	0.12-0.18	3.6-5.5	Low----------	0.28		
	54-59	27-50	1.25-1.50	0.06-0.2	0.11-0.18	3.6-5.5	High---------	0.32		
	59-75	---	---	---	---	---	----------	----		
9, 10---------	0-17	5-15	1.40-1.60	2.0-6.0	0.10-0.15	5.1-6.5	Low----------	0.32	5	.5-1
Bowie	17-42	18-35	1.60-1.75	0.6-2.0	0.15-0.20	4.5-5.5	Low----------	0.32		
	42-72	18-35	1.70-1.80	0.2-0.6	0.15-0.20	4.5-5.5	Low----------	0.28		
11, 12--------	0-9	7-17	1.35-1.60	2.0-6.0	0.10-0.14	4.5-6.0	Low----------	0.24	5	.5-2
Cahaba	9-41	18-35	1.35-1.60	0.6-2.0	0.12-0.15	4.5-6.0	Low----------	0.28		
	41-72	4-20	1.40-1.70	2.0-20	0.05-0.10	4.5-6.0	Low----------	0.24		
13:										
Carnasaw--------	0-4	15-26	1.30-1.60	0.6-2.0	0.08-0.20	4.5-6.0	Low----------	0.32	4	.5-2
	4-15	35-45	1.45-1.70	0.2-0.6	0.12-0.20	4.5-5.5	High---------	0.37		
	15-51	40-65	1.35-1.60	0.06-0.2	0.12-0.18	4.5-5.5	High---------	0.32		
	51-53	---	---	---	---	---	----------	----		
Bismarck--------	0-7	10-18	1.30-1.50	0.6-2.0	0.07-0.13	4.5-6.0	Low----------	0.28	1	.5-2
	7-14	12-20	1.30-1.50	0.6-2.0	0.03-0.13	4.5-6.0	Low----------	0.28		
	14-20	---	---	---	---	---	----------	----		
Sherless--------	0-14	5-18	1.30-1.60	2.0-6.0	0.07-0.11	4.5-7.3	Low----------	0.24	3	.5-1
	14-31	20-35	1.45-1.70	0.6-2.0	0.09-0.18	4.5-5.5	Low----------	0.28		
	31-33	---	---	---	---	---	----------	----		
14, 15:										
Carnasaw--------	0-4	15-26	1.30-1.60	0.6-2.0	0.08-0.20	4.5-6.0	Low----------	0.32	4	.5-2
	4-15	35-45	1.45-1.70	0.2-0.6	0.12-0.20	4.5-5.5	High---------	0.37		
	15-51	40-65	1.35-1.60	0.06-0.2	0.12-0.18	4.5-5.5	High---------	0.32		
	51-53	---	---	---	---	---	----------	----		

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cc	In/hr	In/in	pH				Pct
14, 15:										
Bismarck--------	0-7	10-18	1.30-1.50	0.6-2.0	0.07-0.13	4.5-6.0	Low----------	0.28	1	.5-2
	7-14	12-20	1.30-1.50	0.6-2.0	0.03-0.13	4.5-6.0	Low----------	0.28		
	14-20	---	---	---	---	---	----------	----		
Zafra-----------	0-5	10-18	1.45-1.60	0.6-2.0	0.08-0.14	5.1-6.0	Low----------	0.24	3	.5-1
	5-9	10-18	1.45-1.60	0.6-2.0	0.08-0.14	5.1-6.0	Low----------	0.24		
	9-12	12-27	1.40-1.65	0.6-2.0	0.11-0.14	4.5-5.0	Low----------	0.28		
	12-31	18-35	1.40-1.70	0.6-2.0	0.08-0.11	4.5-5.0	Low----------	0.32		
	31-33	---	---	---	---	---	----------	----		
	33-35	---	---	---	---	---	----------	----		
16---------------	0-7	10-18	1.30-1.60	6.0-20	0.05-0.12	5.6-6.5	Low----------	0.17	5	.5-1
Ceda	7-72	15-32	1.40-1.70	6.0-20	0.02-0.16	5.6-6.5	Low----------	0.28		
17---------------	0-9	2-15	1.20-1.40	2.0-6.0	0.11-0.15	4.5-6.5	Low----------	0.37	3	.5-1
Cuthbert	9-29	35-60	1.24-1.45	0.2-0.6	0.10-0.15	3.6-5.5	Moderate-----	0.32		
	29-72	20-45	1.40-1.65	0.06-0.6	0.08-0.15	3.6-5.5	Moderate-----	0.32		
18---------------	0-7	2-10	1.20-1.60	6.0-20	0.05-0.09	4.5-7.3	Low----------	0.15	5	.5-1
Darden	7-82	2-10	1.20-1.60	6.0-20	0.05-0.09	4.5-7.3	Low----------	0.15		
19---------------	0-3	27-35	1.30-1.50	0.2-0.6	0.10-0.15	7.4-8.4	Low----------	0.20	1	1-2
Demopolis	3-7	20-35	1.30-1.50	0.2-0.6	0.10-0.15	7.4-8.4	Low----------	0.32		
	7-11	---	---	---	---	---	----------	----		
20---------------	0-5	30-38	1.40-1.50	0.06-0.2	0.16-0.19	4.5-6.0	High---------	0.37	5	1-3
Eutaw	5-28	55-70	1.55-1.65	<0.06	0.15-0.18	4.5-6.0	Very high----	0.28		
	28-72	50-65	1.50-1.55	<0.06	0.15-0.18	4.5-7.8	Very high----	0.28		
21---------------	0-5	10-20	1.25-1.60	0.6-2.0	0.13-0.24	4.5-7.3	Low----------	0.43	3	.5-2
Foley	5-23	20-35	1.25-1.50	0.2-0.6	0.18-0.24	5.1-7.3	Moderate-----	0.43		
	23-72	20-35	1.25-1.50	<0.06	0.10-0.14	5.1-9.0	Moderate-----	0.43		
22, 23-----------	0-4	5-15	1.25-1.60	0.6-2.0	0.13-0.24	3.6-6.0	Low----------	0.49	5	1-3
Gurdon	4-30	10-18	1.25-1.55	0.6-2.0	0.13-0.24	3.6-6.0	Low----------	0.49		
	30-72	15-35	1.25-1.60	0.6-2.0	0.13-0.24	3.6-6.0	Low----------	0.49		
24---------------	0-5	7-25	1.35-1.65	0.6-2.0	0.20-0.23	3.6-6.0	Low----------	0.43	5	<2
Guyton	5-23	7-25	1.35-1.65	0.6-2.0	0.18-0.23	3.6-6.0	Low----------	0.37		
	23-44	20-35	1.35-1.70	0.06-0.2	0.15-0.22	3.6-6.0	Low----------	0.37		
	44-72	20-35	1.35-1.70	0.06-2.0	0.15-0.22	3.6-8.4	Low----------	0.37		
25---------------	0-5	7-25	1.35-1.65	0.6-2.0	0.20-0.23	3.6-6.0	Low----------	0.43	5	<2
Guyton	5-23	7-25	1.35-1.65	0.6-2.0	0.18-0.23	3.6-6.0	Low----------	0.37		
	23-44	20-35	1.35-1.65	0.06-0.2	0.15-0.22	3.6-6.0	Low----------	0.37		
	44-72	20-35	1.35-1.65	0.06-2.0	0.15-0.22	3.6-8.4	Low----------	0.37		
26---------------	0-4	2-8	1.25-1.35	0.6-6.0	0.08-0.16	3.6-5.5	Low----------	0.20	5	.5-3
Harleston	4-36	8-18	1.55-1.65	0.6-2.0	0.13-0.16	3.6-5.5	Low----------	0.32		
	36-72	8-27	1.55-1.65	0.6-2.0	0.13-0.16	3.6-5.5	Low----------	0.32		
27, 28-----------	0-20	50-67	1.40-1.50	<0.06	0.15-0.20	6.1-8.4	High---------	0.37	4	2-5
Houston	20-31	52-71	1.30-1.50	<0.06	0.15-0.20	6.1-8.4	Very high----	0.32		
	31-72	53-78	1.30-1.50	<0.06	0.15-0.20	6.6-8.4	Very high----	0.32		
29---------------	0-13	6-15	1.25-1.35	2.0-6.0	0.10-0.15	4.5-5.5	Low----------	0.24	5	.5-2
Iuka	13-45	8-18	1.55-1.65	0.6-2.0	0.10-0.20	4.5-5.5	Low----------	0.28		
	45-72	5-15	1.55-1.65	0.6-2.0	0.10-0.20	4.5-5.5	Low----------	0.20		

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cc	In/hr	In/in	pH				Pct
30----------	0-8	10-20	1.30-1.60	0.6-2.0	0.10-0.18	5.1-6.5	Low----------	0.24	5	.5-2
Kenn	8-28	20-30	1.45-1.70	0.6-2.0	0.06-0.18	4.5-5.5	Moderate-----	0.28		
	28-41	20-30	1.45-1.70	0.6-2.0	0.02-0.10	4.5-5.5	Moderate-----	0.28		
	41-72	10-25	1.40-1.70	0.6-2.0	0.02-0.05	4.5-5.5	Low----------	0.32		
31----------	0-5	16-25	1.30-1.48	0.06-0.2	0.20-0.22	3.6-6.0	Low----------	0.32	5	.5-2
Kipling	5-45	36-60	1.37-1.41	0.06-0.2	0.20-0.22	3.6-8.4	High---------	0.32		
	45-72	40-60	1.57-1.60	<0.06	0.18-0.20	3.6-8.4	Very high----	0.32		
32----------	0-5	28-32	1.30-1.45	0.06-0.2	0.20-0.22	3.6-6.0	Moderate-----	0.32	5	.5-2
Kipling	5-45	36-60	1.37-1.41	0.06-0.2	0.20-0.22	3.6-8.4	High---------	0.32		
	45-72	40-60	1.57-1.60	<0.06	0.18-0.20	5.1-8.4	Very high----	0.32		
33----------	0-7	10-20	1.30-1.50	0.6-2.0	0.15-0.15	4.5-5.5	Low----------	0.28	5	.5-2
Kirkville	7-72	10-18	1.35-1.55	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.28		
34----------	0-8	40-50	1.45-1.65	0.06-0.2	0.18-0.22	5.6-8.4	High---------	0.32	5	1-4
Leeper	8-72	40-50	1.40-1.60	<0.06	0.18-0.20	5.6-8.4	High---------	0.32		
35, 36----------	0-7	7-20	1.30-1.50	0.6-2.0	0.12-0.16	4.5-6.0	Low----------	0.28	5	.5-2
Macon	7-26	18-35	1.35-1.60	0.2-0.6	0.12-0.17	4.5-6.0	Moderate-----	0.28		
	26-72	25-50	1.35-1.55	0.06-0.2	0.11-0.16	4.5-6.0	Moderate-----	0.24		
37----------	0-8	15-25	1.40-1.60	2.0-6.0	0.14-0.17	5.1-6.5	Low----------	0.37	3	2-4
Magnet	8-31	35-55	1.25-1.45	0.2-0.6	0.13-0.18	5.1-6.5	High---------	0.28		
	31-72	---	---	---	---	---	----------	----		
38, 39----------	0-8	15-25	1.40-1.60	2.0-6.0	0.12-0.14	5.1-6.5	Low----------	0.32	3	2-4
Magnet	8-31	35-55	1.25-1.45	0.2-0.6	0.13-0.18	5.1-6.5	High---------	0.28		
	31-72	---	---	---	---	---	----------	----		
40----------	0-11	5-20	1.50-1.55	0.6-2.0	0.14-0.18	5.6-7.8	Low----------	0.28	5	2-4
Marietta	11-36	18-30	1.40-1.55	0.6-2.0	0.14-0.20	5.6-7.8	Low----------	0.28		
	36-72	20-45	1.40-1.55	0.6-2.0	0.14-0.20	5.6-7.8	Moderate-----	0.28		
41----------	0-3	27-40	1.35-1.45	0.06-0.2	0.20-0.22	4.5-6.0	Moderate-----	0.37	5	1-3
Mayhew	3-50	35-60	1.40-1.55	<0.06	0.18-0.20	4.5-6.0	High---------	0.32		
	50-63	35-75	1.40-1.55	<0.06	0.18-0.20	4.5-6.0	High---------	0.32		
	63-72	---	---	---	---	---	----------	----		
42----------	0-9	1-5	1.30-1.70	6.0-20	0.05-0.10	4.5-5.5	Very low-----	0.17	5	.5-2
McLaurin	9-48	10-18	1.40-1.60	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.20		
	48-66	5-15	1.30-1.70	2.0-6.0	0.05-0.10	4.5-5.5	Very low-----	0.20		
	66-72	5-27	1.40-1.60	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.20		
43----------	0-5	2-8	1.20-1.40	6.0-20	0.05-0.10	4.5-6.5	Low----------	0.17	5	.5-2
Nugent	5-72	2-10	1.20-1.40	2.0-6.0	0.05-0.10	4.5-6.5	Low----------	0.17		
44----------	0-12	3-18	1.40-1.60	2.0-6.0	0.07-0.14	4.5-5.5	Low----------	0.20	5	.5-2
Ochlockonee	12-44	8-18	1.40-1.60	0.6-2.0	0.10-0.20	4.5-5.5	Low----------	0.20		
	44-72	3-18	1.40-1.70	2.0-6.0	0.06-0.12	4.5-5.5	Low----------	0.17		
45, 46----------	0-3	10-18	1.20-1.50	0.6-2.0	0.10-0.15	4.5-6.5	Low----------	0.37	3	4-7
Oktibbeha	3-43	50-65	1.00-1.30	<0.06	0.12-0.16	4.5-6.5	High---------	0.32		
	43-49	50-77	1.10-1.40	<0.06	0.05-0.10	6.6-8.4	High---------	0.32		
47----------	0-4	10-18	1.45-1.55	2.0-6.0	0.10-0.13	3.6-5.5	Low----------	0.28	3	1-2
Ora	4-8	10-18	1.45-1.55	0.6-2.0	0.10-0.14	3.6-5.5	Low----------	0.28		
	8-29	18-33	1.45-1.60	0.6-2.0	0.12-0.18	3.6-5.5	Low----------	0.37		
	29-72	18-33	1.70-1.80	0.2-0.6	0.05-0.10	3.6-5.5	Low----------	0.32		

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cc	In/hr	In/in	pH				Pct
48, 49----------	0-6	8-25	1.25-1.60	0.6-2.0	0.15-0.24	4.5-6.0	Low----------	0.37	5	1-2
Ouachita	6-72	18-35	1.25-1.60	0.2-0.6	0.15-0.24	4.5-5.5	Low----------	0.32		
50----------	0-7	5-18	1.30-1.50	0.6-2.0	0.14-0.16	4.5-6.0	Low----------	0.28	5	.5-3
Ozan	7-17	5-18	1.30-1.50	0.6-2.0	0.14-0.17	4.5-6.0	Low----------	0.32		
	17-39	7-18	1.30-1.50	0.06-0.2	0.15-0.18	4.5-6.0	Low----------	0.43		
	39-72	7-30	1.30-1.60	0.06-0.2	0.15-0.18	4.5-6.0	Low----------	0.43		
51, 52----------	0-4	6-15	1.40-1.50	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.24	4	.5-2
Pikeville	4-11	18-35	1.25-1.60	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.37		
	11-35	18-35	1.25-1.60	2.0-6.0	0.05-0.10	4.5-5.5	Low----------	0.10		
	35-72	16-32	1.25-1.60	2.0-6.0	0.04-0.08	4.5-5.5	Low----------	0.10		
53----------	0-10	13-20	1.30-1.60	0.6-2.0	0.12-0.16	4.5-6.0	Low----------	0.24	3	.5-2
Pirum	10-42	18-35	1.25-1.60	0.6-2.0	0.14-0.18	4.5-6.0	Low----------	0.32		
	42-44	---	---	---	---	---	----------	----		
54:										
Pirum----------	0-10	13-20	1.30-1.60	0.6-2.0	0.12-0.16	4.5-6.0	Low----------	0.24	3	.5-2
	10-42	18-35	1.25-1.60	0.6-2.0	0.14-0.18	4.5-6.0	Low----------	0.32		
	42-44	---	---	---	---	---	----------	----		
Sherless--------	0-14	5-18	1.30-1.60	2.0-6.0	0.07-0.11	4.5-7.3	Low----------	0.24	3	.5-1
	14-31	20-35	1.45-1.70	0.6-2.0	0.09-0.18	4.5-5.5	Low----------	0.28		
	31-33	---	---	---	---	---	----------	----		
Shermore--------	0-4	10-15	1.30-1.60	2.0-6.0	0.08-0.15	5.1-6.5	Low----------	0.24	5	.5-2
	4-20	18-35	1.45-1.70	0.6-2.0	0.07-0.15	4.5-6.0	Low----------	0.37		
	20-49	18-38	1.55-1.75	0.2-0.6	0.05-0.10	4.5-6.0	Low----------	0.32		
	49-71	13-35	1.45-1.75	0.6-2.0	0.07-0.15	4.5-6.0	Low----------	0.32		
	71-73	---	---	---	---	---	----------	----		
55:										
Pirum----------	0-10	13-20	1.30-1.60	0.6-2.0	0.10-0.14	4.5-6.0	Low----------	0.20	3	.5-2
	10-42	18-35	1.25-1.60	0.6-2.0	0.14-0.18	4.5-6.0	Low----------	0.32		
	42-44	---	---	---	---	---	----------	----		
Zafra----------	0-5	10-18	1.45-1.60	0.6-2.0	0.08-0.14	5.1-6.0	Low----------	0.24	3	.5-1
	5-9	10-18	1.45-1.60	0.6-2.0	0.08-0.14	5.1-6.0	Low----------	0.24		
	9-12	12-27	1.40-1.65	0.6-2.0	0.11-0.14	4.5-5.0	Low----------	0.28		
	12-31	18-35	1.40-1.70	0.6-2.0	0.08-0.11	4.5-5.0	Low----------	0.32		
	31-33	---	---	---	---	---	----------	----		
	33-35	---	---	---	---	---	----------	----		
Clebit----------	0-6	10-20	1.30-1.60	2.0-6.0	0.04-0.08	5.1-6.5	Low----------	0.17	1	.5-1
	6-17	10-20	1.30-1.60	2.0-6.0	0.04-0.10	4.5-6.5	Low----------	0.28		
	17-19	---	---	---	---	---	----------	----		
56:										
Pits.										
Fluvaquents.										
57, 58, 59-------	0-8	5-20	1.30-1.50	0.6-2.0	0.10-0.20	4.5-5.5	Low----------	0.32	5	1-3
Sacul	8-55	40-60	1.20-1.35	0.06-0.2	0.12-0.18	4.5-5.5	High---------	0.32		
	55-72	20-40	1.25-1.45	0.2-0.6	0.16-0.20	4.5-5.5	Moderate-----	0.37		
60, 61----------	0-8	5-25	1.30-1.50	2.0-6.0	0.08-0.16	4.5-5.5	Low----------	0.20	3	1-3
Sacul	8-55	35-60	1.20-1.35	0.06-0.2	0.12-0.18	4.5-5.5	High---------	0.32		
	55-72	20-40	1.25-1.45	0.2-0.6	0.16-0.20	4.5-5.5	Moderate-----	0.37		

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cc	In/hr	In/in	pH				Pct
62:										
Sacul----------	0-8	5-20	1.30-1.50	0.6-2.0	0.10-0.20	4.5-5.5	Low----------	0.32	5	1-3
	8-55	40-60	1.20-1.35	0.06-0.2	0.12-0.18	4.5-5.5	High---------	0.32		
	55-72	20-40	1.25-1.45	0.2-0.6	0.16-0.20	4.5-5.5	Moderate-----	0.37		
Ruston----------	0-13	5-20	1.30-1.70	0.6-2.0	0.09-0.16	4.5-6.5	Low----------	0.28	5	.5-2
	13-25	18-35	1.40-1.80	0.6-2.0	0.12-0.17	4.5-6.0	Low----------	0.28		
	25-30	10-20	1.30-1.70	0.6-2.0	0.12-0.15	4.5-6.0	Low----------	0.32		
	30-72	15-38	1.40-1.70	0.6-2.0	0.12-0.17	4.5-6.0	Low----------	0.28		
63:										
Sacul----------	0-8	5-20	1.30-1.50	0.6-2.0	0.10-0.20	4.5-5.5	Low----------	0.32	5	1-3
	8-55	40-60	1.20-1.35	0.06-0.2	0.12-0.18	4.5-5.5	High---------	0.32		
	55-72	20-40	1.25-1.45	0.2-0.6	0.16-0.20	4.5-5.5	Moderate-----	0.37		
Smithdale-------	0-7	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28	5	.5-2
	7-42	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.24		
	42-72	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28		
64, 65----------	0-6	5-20	1.30-1.60	2.0-6.0	0.05-0.10	4.5-5.5	Low----------	0.20	4	1-2
Saffell	6-11	10-35	1.25-1.60	0.6-2.0	0.06-0.10	4.5-5.5	Low----------	0.28		
	11-57	12-35	1.25-1.60	0.6-2.0	0.06-0.12	4.5-5.5	Low----------	0.28		
	57-72	10-20	1.30-1.65	0.6-6.0	0.04-0.11	4.5-5.5	Low----------	0.17		
66:										
Saffell---------	0-6	5-20	1.30-1.60	2.0-6.0	0.05-0.10	4.5-5.5	Low----------	0.20	4	1-2
	6-11	10-35	1.25-1.60	0.6-2.0	0.06-0.10	4.5-5.5	Low----------	0.28		
	11-57	12-35	1.25-1.60	0.6-2.0	0.06-0.12	4.5-5.5	Low----------	0.28		
	57-72	10-20	1.30-1.65	0.6-6.0	0.04-0.11	4.5-5.5	Low----------	0.17		
Sacul----------	0-8	5-20	1.30-1.50	2.0-6.0	0.08-0.16	4.5-5.5	Low----------	0.20	3	1-3
	8-55	40-60	1.20-1.35	0.06-0.2	0.12-0.18	4.5-5.5	High---------	0.32		
	55-72	20-40	1.25-1.45	0.2-0.6	0.16-0.20	4.5-5.5	Moderate-----	0.37		
67, 68----------	0-6	10-25	1.25-1.60	0.6-2.0	0.15-0.24	4.5-6.0	Low----------	0.37	5	1-3
Sardis	6-65	14-35	1.25-1.60	0.6-2.0	0.15-0.24	4.5-6.0	Low----------	0.37		
	65-72	8-25	1.25-1.60	0.6-2.0	0.10-0.24	4.5-6.0	Low----------	0.37		
69, 70----------	0-8	3-16	1.45-1.65	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.24	3	.5-3
Savannah	8-25	18-32	1.55-1.75	0.6-2.0	0.13-0.20	4.5-5.5	Low----------	0.28		
	25-72	18-32	1.60-1.80	0.2-0.6	0.05-0.10	4.5-5.5	Low----------	0.24		
71, 72----------	0-5	15-25	1.25-1.60	0.6-2.0	0.15-0.24	3.6-5.5	Low----------	0.43	3	1-3
Sawyer	5-29	20-35	1.25-1.60	0.2-0.6	0.15-0.24	3.6-5.5	Moderate-----	0.37		
	29-72	40-60	1.15-1.50	0.06-0.2	0.12-0.18	3.6-5.5	High---------	0.32		
73----------	0-4	10-15	1.30-1.60	2.0-6.0	0.08-0.15	5.1-6.5	Low----------	0.24	5	.5-2
Shermore	4-20	18-35	1.45-1.70	0.6-2.0	0.07-0.15	4.5-6.0	Low----------	0.37		
	20-71	18-38	1.55-1.75	0.2-0.6	0.05-0.10	4.5-6.0	Low----------	0.32		
74, 75----------	0-13	10-18	1.30-1.60	2.0-6.0	0.10-0.20	4.5-6.0	Low----------	0.24	4	.5-2
Sherwood	13-34	18-35	1.40-1.70	0.6-2.0	0.11-0.18	4.5-5.5	Low----------	0.32		
	34-45	18-35	1.40-1.70	0.6-2.0	0.09-0.15	4.5-5.5	Low----------	0.32		
	45-47	---	---	---	---	---	----------	----		
76----------	0-7	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28	5	.5-2
Smithdale	7-42	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.24		
	42-72	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28		

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cc	In/hr	In/in	pH				Pct
77:										
Smithdale-------	0-7	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28	5	.5-2
	7-42	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.24		
	42-72	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28		
Bowie-----------	0-17	5-15	1.40-1.60	2.0-6.0	0.10-0.15	5.1-6.5	Low----------	0.32	5	.5-1
	17-42	18-35	1.60-1.75	0.6-2.0	0.15-0.20	4.5-5.5	Low----------	0.32		
	42-72	18-35	1.70-1.80	0.2-0.6	0.15-0.20	4.5-5.5	Low----------	0.28		
Sacul-----------	0-8	5-20	1.30-1.50	0.6-2.0	0.10-0.20	4.5-5.5	Low----------	0.32	5	1-3
	8-55	40-60	1.20-1.35	0.06-0.2	0.12-0.18	4.5-5.5	High---------	0.32		
	55-72	20-40	1.25-1.45	0.2-0.6	0.16-0.20	4.5-5.5	Moderate-----	0.37		
78---------------	0-5	5-18	1.30-1.50	0.6-2.0	0.12-0.20	4.5-5.5	Low----------	0.32	5	1-3
Smithton	5-50	12-18	1.30-1.50	0.2-0.6	0.11-0.20	4.5-5.5	Low----------	0.32		
	50-72	15-25	1.25-1.45	0.2-0.6	0.11-0.24	4.5-5.5	Low----------	0.37		
79---------------	0-3	5-15	1.40-1.55	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.37	3	2-3
Stough	3-8	8-18	1.45-1.60	0.2-0.6	0.07-0.11	4.5-5.5	Low----------	0.37		
	8-72	5-27	1.55-1.65	0.2-0.6	0.07-0.11	4.5-5.5	Low----------	0.37		
80, 81-----------	0-3	40-50	1.30-1.60	0.06-2.0	0.12-0.17	6.6-8.4	High---------	0.37	3	2-5
Sumter	3-31	35-57	1.15-1.55	0.06-2.0	0.12-0.17	7.4-8.4	High---------	0.37		
	31-60	---	---	---	---	---	----------	----		
82, 83-----------	0-22	45-58	1.15-1.45	<0.06	0.14-0.18	6.1-7.3	Very high----	0.32	5	2-4
Terouge	22-72	45-58	1.15-1.45	<0.06	0.14-0.18	6.6-8.4	Very high----	0.32		
84---------------	0-13	5-15	1.40-1.50	0.6-2.0	0.11-0.15	5.1-6.5	Low----------	0.24	3	1-3
Toine	13-58	20-35	1.25-1.50	0.6-2.0	0.12-0.20	4.5-5.5	Low----------	0.32		
	58-72	10-27	1.35-1.50	0.6-2.0	0.11-0.24	4.5-5.5	Low----------	0.24		
85---------------	0-6	5-20	1.40-1.50	0.6-2.0	0.16-0.20	4.5-5.5	Low----------	0.43	5	1-3
Trebloc	6-61	20-32	1.45-1.55	0.2-0.6	0.15-0.20	4.5-5.5	Moderate-----	0.37		
	61-72	20-45	1.45-1.55	0.2-0.6	0.14-0.18	4.5-5.5	Moderate-----	0.37		
86---------------	0-7	40-50	1.45-1.55	0.06-0.2	0.20-0.22	5.1-8.4	High---------	0.32	5	1-3
Tuscumbia	7-72	32-60	1.50-1.60	<0.06	0.18-0.20	5.1-8.4	Very high----	0.28		
87:										
Udorthents.										
88---------------	0-6	28-40	1.40-1.60	<0.06	0.15-0.20	4.5-5.5	High---------	0.32	5	1-3
Una	6-72	28-55	1.40-1.60	<0.06	0.15-0.20	4.5-5.5	High---------	0.28		
89---------------	0-4	27-35	1.40-1.50	0.06-0.2	0.19-0.21	4.5-5.5	Low----------	0.49	5	1-3
Urbo	4-72	35-55	1.45-1.55	<0.06	0.18-0.20	4.5-5.5	Moderate-----	0.28		
90, 91-----------	0-4	15-27	1.40-1.45	0.06-0.2	0.19-0.21	3.6-5.5	High---------	0.37	4	.5-2
Wilcox	4-52	35-60	1.40-1.50	<0.06	0.18-0.20	3.6-5.5	High---------	0.32		
	52-62	40-70	1.40-1.55	<0.06	0.15-0.18	3.6-5.5	High---------	0.28		
	62-72	---	---	---	---	---	----------	----		
92---------------	0-10	10-20	1.40-1.50	0.6-2.0	0.11-0.17	4.5-7.3	Low----------	0.28	3	.5-2
Wing Variant	10-20	20-35	1.25-1.50	0.2-0.6	0.15-0.18	5.6-8.4	Low----------	0.32		
	20-45	27-45	1.25-1.40	<0.06	0.16-0.18	5.6-8.4	Moderate-----	0.32		
	45-50	---	---	---	---	---	----------	----		

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cc	In/hr	In/in	pH				Pct
93:										
Yanush----------	0-15	18-26	1.30-1.55	0.6-2.0	0.08-0.17	5.6-6.5	Low----------	0.32	5	.5-2
	15-65	27-35	1.45-1.70	0.6-2.0	0.05-0.11	4.5-6.0	Moderate-----	0.28		
	65-72	---	---	---	---	---	----------	----		
Ceda----------	0-7	10-18	1.30-1.55	6.0-20	0.07-0.17	5.6-6.5	Low----------	0.28	5	.5-1
	7-72	15-32	1.40-1.70	6.0-20	0.02-0.16	5.6-6.5	Low----------	0.28		
94:										
Yanush----------	0-15	18-26	1.30-1.55	0.6-2.0	0.08-0.17	5.6-6.5	Low----------	0.32	5	.5-2
	15-65	27-35	1.45-1.70	0.6-2.0	0.05-0.11	4.5-6.0	Moderate-----	0.28		
	65-72	---	---	---	---	---	----------	----		
Carnasaw--------	0-4	15-26	1.30-1.60	0.6-2.0	0.08-0.20	4.5-6.0	Low----------	0.32	4	.5-2
	4-15	35-45	1.45-1.70	0.2-0.6	0.12-0.20	4.5-5.5	High---------	0.37		
	15-51	40-65	1.35-1.60	0.06-0.2	0.12-0.18	4.5-5.5	High---------	0.32		
	51-53	---	---	---	---	---	----------	----		
Bigfork---------	0-5	20-26	1.30-1.55	0.6-2.0	0.02-0.16	5.1-6.5	Low----------	0.32	2	.5-2
	5-26	27-35	1.45-1.70	0.6-2.0	0.02-0.14	4.5-6.0	Low----------	0.28		
	26-30	---	---	---	---	---	----------	----		
95:										
Yanush----------	0-15	18-26	1.30-1.55	0.6-2.0	0.08-0.17	5.6-6.5	Low----------	0.32	5	.5-2
	15-65	27-35	1.45-1.70	0.6-2.0	0.05-0.11	4.5-6.0	Moderate-----	0.28		
	65-72	---	---	---	---	---	----------	----		
Bigfork---------	0-5	20-26	1.30-1.55	0.6-2.0	0.02-0.16	5.1-6.5	Low----------	0.32	2	.5-2
	5-26	27-35	1.45-1.70	0.6-2.0	0.02-0.14	4.5-6.0	Low----------	0.28		
	26-30	---	---	---	---	---	----------	----		
Carnasaw--------	0-4	15-26	1.30-1.60	0.6-2.0	0.08-0.20	4.5-6.0	Low----------	0.32	4	.5-2
	4-15	35-45	1.45-1.70	0.2-0.6	0.12-0.20	4.5-5.5	High---------	0.37		
	15-51	40-65	1.35-1.60	0.06-0.2	0.12-0.18	4.5-5.5	High---------	0.32		
	51-53	---	---	---	---	---	----------	----		
96:										
Zafra-----------	0-5	10-18	1.45-1.60	0.6-2.0	0.08-0.14	5.1-6.0	Low----------	0.24	3	.5-1
	5-9	10-18	1.45-1.60	0.6-2.0	0.08-0.14	5.1-6.0	Low----------	0.24		
	9-12	12-27	1.40-1.65	0.6-2.0	0.11-0.14	4.5-5.0	Low----------	0.28		
	12-31	18-35	1.40-1.70	0.6-2.0	0.08-0.11	4.5-5.0	Low----------	0.32		
	31-33	---	---	---	---	---	----------	----		
	33-35	---	---	---	---	---	----------	----		
Carnasaw--------	0-4	15-26	1.30-1.60	0.6-2.0	0.08-0.20	4.5-6.0	Low----------	0.32	4	.5-2
	4-15	35-45	1.45-1.70	0.2-0.6	0.12-0.20	4.5-5.5	High---------	0.37		
	15-51	40-65	1.35-1.60	0.06-0.2	0.12-0.18	4.5-5.5	High---------	0.32		
	51-53	---	---	---	---	---	----------	----		
Pirum-----------	0-10	13-20	1.30-1.60	0.6-2.0	0.10-0.14	4.5-6.0	Low----------	0.20	3	.5-2
	10-42	18-35	1.25-1.60	0.6-2.0	0.14-0.18	4.5-6.0	Low----------	0.32		
	42-44	---	---	---	---	---	----------	----		
97:										
Zafra-----------	0-5	10-18	1.45-1.60	0.6-2.0	0.08-0.14	5.1-6.0	Low----------	0.24	3	.5-1
	5-9	10-18	1.45-1.60	0.6-2.0	0.08-0.14	5.1-6.0	Low----------	0.24		
	9-12	12-27	1.40-1.65	0.6-2.0	0.11-0.14	4.5-5.0	Low----------	0.28		
	12-31	18-35	1.40-1.70	0.6-2.0	0.08-0.11	4.5-5.0	Low----------	0.32		
	31-33	---	---	---	---	---	----------	----		
	33-35	---	---	---	---	---	----------	----		

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cc	In/hr	In/in	pH				Pct
97:										
Carnasaw--------	0-4	15-26	1.30-1.60	0.6-2.0	0.08-0.20	4.5-6.0	Low----------	0.32	4	.5-2
	4-15	35-45	1.45-1.70	0.2-0.6	0.12-0.20	4.5-5.5	High---------	0.37		
	15-51	40-65	1.35-1.60	0.06-0.2	0.12-0.18	4.5-5.5	High---------	0.32		
	51-53	---	---	---	---	---	----------	----		
Clebit----------	0-6	10-20	1.30-1.60	2.0-6.0	0.04-0.08	5.1-6.5	Low----------	0.17	1	.5-1
	6-17	10-20	1.30-1.60	2.0-6.0	0.04-0.10	4.5-6.5	Low----------	0.28		
	17-19	---	---	---	---	---	----------	----		

TABLE 18.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
1---------- Adaton	D	Rare--------	---	---	0-0.5	Apparent	Jan-Apr	>60	---	High-----	High.
2---------- Amy	D	Rare--------	---	---	0-1.0	Perched	Dec-Apr	>60	---	High-----	Moderate.
3---------- Avilla	B	Rare--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
4, 5: Bigfork----------	C	None--------	---	---	>6.0	---	---	20-50	Hard	Moderate	High.
Rock outcrop.											
6, 7---------- Bismarck	D	None--------	---	---	>6.0	---	---	10-20	Soft	Moderate	Moderate.
8---------- Bonnerdale	B	None--------	---	---	0.5-1.0	Perched	Dec-May	>40	Soft	Moderate	High.
9, 10---------- Bowie	B	None--------	---	---	3.0-4.0	Perched	Dec-Mar	>60	---	Moderate	High.
11, 12---------- Cahaba	B	Rare--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
13: Carnasaw---------	C	None--------	---	---	>6.0	---	---	40-60	Soft	High-----	High.
Bismarck---------	D	None--------	---	---	>6.0	---	---	10-20	Soft	Moderate	Moderate.
Sherless---------	B	None--------	---	---	>6.0	---	---	20-40	Soft	Moderate	Moderate.
14, 15: Carnasaw---------	C	None--------	---	---	>6.0	---	---	40-60	Soft	High-----	High.
Bismarck---------	D	None--------	---	---	>6.0	---	---	10-20	Soft	Moderate	Moderate.
Zafra----------	B	None--------	---	---	>6.0	---	---	25-60	Hard	Moderate	High.
16---------- Ceda	B	Occasional	Very brief	Jan-Jul	>6.0	---	---	>60	---	Low------	Moderate.
17---------- Cuthbert	C	None--------	---	---	>6.0	---	---	>60	---	High-----	High.
18---------- Darden	A	None--------	---	---	>6.0	---	---	>60	---	Low------	High.
19---------- Demopolis	C	None--------	---	---	>6.0	---	---	4-16	Soft	Moderate	Low.
20---------- Eutaw	D	None--------	---	---	0.5-1.5	Perched	Dec-Apr	>60	---	High-----	Moderate.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
21---- Foley	D	None----	---	---	0-1.0	Perched	Dec-Apr	>60	---	High----	Low.
22---- Gurdon	C	Rare----	---	---	1.0-2.0	Apparent	Dec-Mar	>60	---	High----	High.
23---- Gurdon	C	Occasional	Brief----	Dec-Mar	1.0-2.0	Apparent	Dec-Mar	>60	---	High----	High.
24---- Guyton	D	Occasional	Very brief to long.	Dec-Mar	0-1.5	Perched	Nov-May	>60	---	High----	Moderate.
25---- Guyton	D	Frequent----	Very long	Jan-Dec	+3-0.5	Perched	Jan-Dec	>60	---	High----	Moderate.
26---- Harleston	C	Rare----	---	---	2.0-3.0	Apparent	Nov-Mar	>60	---	Moderate	High.
27, 28---- Houston	D	None----	---	---	4.0-6.0	Apparent	Jan-Mar	48-60	Soft	High----	Moderate.
29---- Iuka	C	Occasional	Very brief to brief.	Dec-Apr	1.0-3.0	Apparent	Dec-Apr	>60	---	Moderate	High.
30---- Kenn	B	Occasional	Very brief	Jan-Jul	>6.0	---	---	>60	---	Moderate	Moderate.
31, 32---- Kipling	D	None----	---	---	1.5-3.0	Perched	Jan-Mar	>60	---	High----	High.
33---- Kirkville	C	Occasional	Brief----	Jan-Apr	1.5-2.5	Apparent	Jan-Apr	>60	---	Moderate	High.
34---- Leeper	D	Occasional	Brief----	Jan-Mar	1.0-2.0	Apparent	Jan-Mar	>60	---	High----	Low.
35, 36---- Macon	B	None----	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
37, 38, 39---- Magnet	C	None----	---	---	>6.0	---	---	20-50	Soft	Moderate	Low.
40---- Marietta	C	Occasional	Brief----	Jan-Mar	1.5-2.0	Apparent	Jan-Mar	>60	---	Moderate	Low.
41---- Mayhew	D	None----	---	---	0-1.0	Apparent	Jan-Mar	>60	---	High----	High.
42---- McLaurin	B	None----	---	---	>6.0	---	---	>60	---	Low----	Moderate.
43---- Nugent	A	Frequent----	Brief to long.	Dec-Apr	3.5-6.0	Apparent	Jan-Apr	>60	---	Low----	Moderate.
44---- Ochlockonee	B	Occasional	Very brief	Dec-Apr	3.0-5.0	Apparent	Dec-Apr	>60	---	Low----	High.
45, 46---- Oktibbeha	D	None----	---	---	>6.0	---	---	>60	---	High----	High.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
47---- Ora	C	None----	---	---	2.0-3.5	Perched	Feb-Apr	>60	---	Moderate	High.
48---- Ouachita	C	Rare----	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
49---- Ouachita	C	Occasional	Long to very long.	Dec-May	>6.0	---	---	>60	---	Moderate	Moderate.
50---- Ozan	D	Occasional	Very brief to brief.	Dec-May	1.0-2.5	Perched	Dec-May	>60	---	High-----	Moderate.
51, 52---- Pikeville	B	None----	---	---	>6.0	---	---	>60	---	Low------	Moderate.
53---- Pirum	B	None----	---	---	>6.0	---	---	22-50	Hard	Low------	High.
54:											
Pirum----	B	None----	---	---	>6.0	---	---	22-50	Hard	Low------	High.
Sherless----	B	None----	---	---	>6.0	---	---	20-40	Soft	Moderate	Moderate.
Shermore----	B	None----	---	---	1.5-3.5	Perched	Nov-Apr	>60	---	Moderate	High.
55:											
Pirum----	B	None----	---	---	>6.0	---	---	22-50	Hard	Low------	High.
Zafra----	B	None----	---	---	>6.0	---	---	25-60	Hard	Moderate	High.
Clebit----	D	None----	---	---	>6.0	---	---	10-20	Hard	Low------	Moderate.
56:											
Pits.											
Fluvaquents.											
57, 58, 59, 60, 61---- Sacul	C	None----	---	---	2.0-4.0	Apparent	Dec-Apr	>60	---	High-----	Moderate.
62:											
Sacul----	C	None----	---	---	2.0-4.0	Apparent	Dec-Apr	>60	---	High-----	Moderate.
Ruston----	B	None----	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
63:											
Sacul----	C	None----	---	---	2.0-4.0	Apparent	Dec-Apr	>60	---	High-----	Moderate.
Smithdale----	B	None----	---	---	>6.0	---	---	>60	---	Low------	Moderate.
64, 65---- Saffell	B	None----	---	---	>6.0	---	---	>60	---	Low------	Moderate.
66:											
Saffell----	B	None----	---	---	>6.0	---	---	>60	---	Low------	Moderate.
Sacul----	C	None----	---	---	2.0-4.0	Apparent	Dec-Apr	>60	---	High-----	Moderate.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
67---------- Sardis	C	Rare--------	---	---	1.0-3.0	Apparent	Jan-May	>60	---	High-----	Moderate.
68---------- Sardis	C	Occasional	Brief-----	Dec-May	1.0-3.0	Apparent	Jan-May	>60	---	High-----	Moderate.
69, 70---------- Savannah	C	None--------	---	---	1.5-3.0	Perched	Jan-Mar	>60	---	Moderate	High.
71, 72---------- Sawyer	C	None--------	---	---	2.0-3.0	Perched	Dec-Apr	>60	---	High-----	High.
73---------- Shermore	B	None--------	---	---	1.5-3.5	Perched	Nov-Apr	>60	---	Moderate	High.
74, 75---------- Sherwood	B	None--------	---	---	>6.0	---	---	30-60	Hard	Moderate	Moderate.
76---------- Smithdale	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
77:											
Smithdale--------	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
Bowie----------	B	None--------	---	---	3.0-4.0	Perched	Dec-Mar	>60	---	Moderate	High.
Sacul----------	C	None--------	---	---	2.0-4.0	Apparent	Dec-Apr	>60	---	High-----	Moderate.
78---------- Smithton	D	Rare--------	---	---	0-1.0	Perched	Dec-May	>60	---	High-----	High.
79---------- Stough	C	Rare--------	---	---	1.0-1.5	Perched	Jan-Apr	>60	---	Moderate	High.
80, 81---------- Sumter	C	None--------	---	---	>6.0	---	---	20-40	Soft	Moderate	Low.
82---------- Terouge	D	Rare--------	---	---	0-1.0	Perched	Dec-Apr	>60	---	High-----	Low.
83---------- Terouge	D	Occasional	Brief to long.	Dec-May	0-1.0	Perched	Dec-Apr	>60	---	High-----	Low.
84---------- Toine	B	Occasional	Brief to long.	Dec-Apr	>6.0	---	---	>60	---	Moderate	High.
85---------- Trebloc	D	None--------	---	---	0.5-1.0	Apparent	Jan-Apr	>60	---	High-----	High.
86---------- Tuscumbia	D	Occasional	Brief to long.	Jan-Mar	0.5-1.5	Apparent	Dec-Apr	>60	---	High-----	Low.
87: Udorthents.											
88---------- Una	D	Occasional	Brief to long.	Jan-Mar	0.5-1.0	Apparent	Nov-Apr	>60	---	High-----	High.
89---------- Urbo	D	Occasional	Brief to long.	Jan-Mar	1.0-2.0	Apparent	Jan-Mar	>60	---	High-----	High.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
90, 91---------- Wilcox	D	None--------	---	---	1.5-3.0	Perched	Jan-Apr	40-60	Soft	High-----	High.
92---------- Wing Variant	D	None--------	---	---	0-1.0	Apparent	Dec-Mar	>40	Soft	High-----	Moderate.
93:											
Yanush----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Ceda----------	B	Frequent----	Very brief	Jan-Jul	>6.0	---	---	>60	---	Low------	Moderate.
94:											
Yanush----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Carnasaw---------	C	None--------	---	---	>6.0	---	---	40-60	Soft	High-----	High.
Bigfork----------	C	None--------	---	---	>6.0	---	---	20-50	Hard	Moderate	High.
95:											
Yanush----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Bigfork----------	C	None--------	---	---	>6.0	---	---	20-50	Hard	Moderate	High.
Carnasaw---------	C	None--------	---	---	>6.0	---	---	40-60	Soft	High-----	High.
96:											
Zafra----------	B	None--------	---	---	>6.0	---	---	25-60	Hard	Moderate	High.
Carnasaw---------	C	None--------	---	---	>6.0	---	---	40-60	Soft	High-----	High.
Pirum----------	B	None--------	---	---	>6.0	---	---	22-50	Hard	Low------	High.
97:											
Zafra----------	B	None--------	---	---	>6.0	---	---	25-60	Hard	Moderate	High.
Carnasaw---------	C	None--------	---	---	>6.0	---	---	40-60	Soft	High-----	High.
Clebit----------	D	None--------	---	---	>6.0	---	---	10-20	Hard	Low------	Moderate.

TABLE 19.--PHYSICAL ANALYSES OF SELECTED SOILS

[All of these soils are the typical pedon for the official series. For the location of the pedons see the section "Soil series and their morphology."]

Soil series and sample number	Depth	Horizon	Particle-size distribution					
			Sand				Silt	Clay
			Very coarse through medium (2.0-0.25)	Fine (0.25-0.10)	Very fine (0.10-0.05)	Total (2.0-0.05)	(0.05-0.002)	(<0.002)
	In		Mm	Mm	Mm	Mm	Mm	Mm
Bismarck:								
S82-AR059-1-(1-3)	0- 3	Ap	37.6	3.8	2.8	44.2	40.9	14.9
	3- 7	E	34.8	3.8	2.2	40.8	44.3	14.9
	7-14	Bw	32.6	4.2	2.1	38.9	45.6	15.5
Bonnedale:								
S81-Ar059-3-(1-6)	0- 5	A	9.4	24.5	20.9	54.8	39.0	6.2
	5-19	BE	7.8	27.2	22.8	57.8	33.0	9.2
	19-34	Bt1	7.0	24.8	20.0	51.8	33.7	14.5
	34-45	Bt2	6.4	25.7	20.0	52.1	31.9	16.0
	45-54	Bt3	6.4	23.9	19.3	49.6	30.2	20.2
	54-59	2Cg	4.8	17.7	13.6	36.1	33.2	30.7
Gurdon:								
S79-AR019-18(1-8)	0- 4	A	2.6	4.2	8.3	15.1	77.0	7.9
	4-10	BE	1.9	4.1	8.4	14.4	75.9	9.7
	10-21	Bt1	1.4	3.0	7.1	11.5	72.5	16.0
	21-30	Bt2	1.2	2.9	6.8	10.9	70.8	18.3
	30-40	Bt3	1.0	3.0	7.1	11.1	72.5	16.4
	40-50	Bt3	0.9	2.6	6.8	10.3	73.2	16.6
	50-64	Bt4	0.7	3.0	6.8	10.5	71.0	18.5
	64-72	Bt5	2.0	2.4	4.7	9.1	59.1	31.8
Magnet:								
S81-AR059-1-(1-4)	0- 4	Ap	16.6	9.3	7.2	32.2	49.2	18.6
	4- 8	A	13.7	9.1	7.1	29.9	46.6	23.5
	8-23	Bt1	6.4	4.0	4.4	14.8	35.9	49.3
	23-31	Bt2	14.1	5.4	5.0	24.5	42.9	32.6

TABLE 20.--CHEMICAL ANALYSES OF SELECTED SOILS

[All of these soils are the typical pedon for the official servies. For the location of the pedons see the section "Soil series and their morphology."]

Soil name and sample name	Depth	Horizon	Extractable bases				Extractable acidity	Base saturation	Reaction (1:1 soil) water	Organic matter
			Ca	Mg	Na	K				
	In		meq/100g					Pct	pH	Pct
Bismarck: *										
S82-AR059-	0- 3	Ap	9.3	3.4	0.0	0.4	19.5	40	5.2	---
1-(1-3)	3- 7	E	3.8	2.3	0.0	0.2	17.9	26	5.1	---
	7-14	Bw	3.5	1.5	0.0	0.1	15.9	24	5.1	---
Bonnerdale:										
S81-AR059-	0- 5	A	0.7	0.4	0.1	0.1	12.1	10	4.2	3.3
3-(1-6)	5-19	BE	0.1	0.2	0.0	0.0	5.3	5	4.1	0.6
	19-34	Bt1	0.2	1.0	0.1	0.1	7.8	14	4.1	0.3
	34-45	Bt2	0.1	1.7	0.0	0.0	8.6	17	3.9	0.3
	45-54	Bt3	0.1	2.0	0.1	0.1	10.1	19	4.4	0.2
	54-59	2Cg	0.4	4.6	0.2	0.2	14.6	27	4.4	0.4
Gurdon:										
S79-AR019-	0- 4	A	0.7	0.6	0.0	0.1	10.2	12	4.5	2.3
18-(1-8)	4-10	BE	0.1	0.6	0.0	0.0	8.6	8	4.5	0.7
	10-21	Bt1	0.3	0.8	0.1	0.1	12.0	10	4.4	0.3
	21-30	Bt2	0.2	0.9	0.1	0.1	12.0	10	4.4	0.3
	30-40	Bt3	0.2	0.8	0.1	0.0	13.5	8	4.5	0.3
	40-50	Bt3	0.2	0.5	0.2	0.1	12.6	7	4.5	0.3
	50-64	Bt4	0.2	1.3	1.3	0.1	14.4	17	4.8	0.3
	64-72	Bt5	0.1	1.3	1.3	0.1	24.2	10	4.8	0.3
Magnet:										
S81-AR059-	0- 4	Ap	3.6	3.2	0.0	0.5	13.2	36	5.5	3.1
1-(1-4)	4- 8	A	3.5	3.2	0.6	0.4	9.2	46	5.5	2.0
	8-23	Bt1	13.5	3.8	0.0	0.6	12.6	59	6.1	1.0
	23-31	Bt2	3.4	11.5	0.2	0.2	12.1	56	5.5	0.5

* Organic matter is not shown for the Bismarck soil because the amounts reported seem to be unrealistically high.

TABLE 21.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Adaton	Fine-silty, mixed, thermic Typic Ochraqualfs
Amy	Fine-silty, siliceous, thermic Typic Ochraquults
Avilla	Fine-loamy, siliceous, thermic Typic Paleudults
Bigfork	Loamy-skeletal, siliceous, thermic Typic Hapludults
Bismarck	Loamy-skeletal, mixed, thermic, shallow Typic Dystrochrepts
Bonnerdale	Coarse-loamy, siliceous, thermic Aquic Hapludults
Bowie	Fine-loamy, siliceous, thermic Plinthic Paleudults
Cahaba	Fine-loamy, siliceous, thermic Typic Hapludults
Carnasaw	Clayey, mixed, thermic Typic Hapludults
Ceda	Loamy-skeletal, siliceous, nonacid, thermic Typic Udifluvents
Clebit	Loamy-skeletal, siliceous, thermic Lithic Dystrochrepts
Cuthbert	Clayey, mixed, thermic Typic Hapludults
Darden	Thermic, coated Typic Quartzipsamments
Demopolis	Loamy-skeletal, carbonatic, thermic, shallow Typic Udorthents
Eutaw	Very-fine, montmorillonitic, thermic Entic Pelluderts
Foley	Fine-silty, mixed, thermic Albic Glossic Natraqualfs
Gurdon	Coarse-silty, siliceous, thermic Aquic Paleudults
Guyton	Fine-silty, siliceous, thermic Typic Glossaqualfs
Harleston	Coarse-loamy, siliceous, thermic Aquic Paleudults
Houston	Very-fine, montmorillonitic, thermic Typic Chromuderts
Iuka	Coarse-loamy, siliceous, acid, thermic Aquic Udifluvents
Kenn	Fine-loamy, siliceous, thermic Ultic Hapludalfs
Kipling	Fine, montmorillonitic, thermic Vertic Hapludalfs
Kirkville	Coarse-loamy, siliceous, thermic Fluvaquentic Dystrochrepts
Leeper	Fine, montmorillonitic, nonacid, thermic Vertic Haplaquepts
Macon	Fine-loamy, mixed, thermic Typic Paleudalfs
Magnet	Fine, mixed, thermic Ultic Hapludalfs
Marietta	Fine-loamy, siliceous, thermic Fluvaquentic Eutrochrepts
Mayhew	Fine, montmorillonitic, thermic Vertic Ochraqualfs
McLaurin	Coarse-loamy, siliceous, thermic Typic Paleudults
Nugent	Sandy, siliceous, thermic Typic Udifluvents
Ochlockonee	Coarse-loamy, siliceous, acid, thermic Typic Udifluvents
Oktibbeha	Very-fine, montmorillonitic, thermic Vertic Hapludalfs
Ora	Fine-loamy, siliceous, thermic Typic Fragiudults
Ouachita	Fine-silty, siliceous, thermic Fluventic Dystrochrepts
Ozan	Coarse-loamy, siliceous, thermic Typic Glossaqualfs
Pikeville	Fine-loamy, siliceous, thermic Typic Paleudults
Pirum	Fine-loamy, siliceous, thermic Typic Hapludults
Ruston	Fine-loamy, siliceous, thermic Typic Paleudults
Sacul	Clayey, mixed, thermic Aquic Hapludults
Saffell	Loamy-skeletal, siliceous, thermic Typic Hapludults
Sardis	Fine-silty, siliceous, thermic Fluvaquentic Dystrochrepts
Savannah	Fine-loamy, siliceous, thermic Typic Fragiudults
Sawyer	Fine-silty, siliceous, thermic Aquic Paleudults
Sherless	Fine-loamy, mixed, thermic Typic Hapludults
*Shermore	Fine-loamy, siliceous, thermic Typic Fragiudalfs
Sherwood	Fine-loamy, mixed, thermic Typic Hapludults
Smithdale	Fine-loamy, siliceous, thermic Typic Hapludults
Smithton	Coarse-loamy, siliceous, thermic Typic Paleaquults
Stough	Coarse-loamy, siliceous, thermic Fragiaquic Paleudults
Sumter	Fine-silty, carbonatic, thermic Rendollic Eutrochrepts
*Terouge	Fine, montmorillonitic, thermic Aquic Chromuderts
Toine	Fine-loamy, mixed, thermic Ultic Hapludalfs
Trebloc	Fine-silty, siliceous, thermic Typic Paleaquults
Tuscumbia	Fine, mixed, nonacid, thermic Vertic Haplaquepts
Udorthents	Loamy, thermic Udorthents
Una	Fine, mixed, acid, thermic Typic Haplaquepts
Urbo	Fine, mixed, acid, thermic Aeric Haplaquepts

TABLE 21.--CLASSIFICATION OF THE SOILS-Continued

Soil name	Family or higher taxonomic class
Wilcox	Fine, montmorillonitic, thermic Vertic Hapludalfs
Wing Variant	Fine-loamy, mixed, thermic Typic Natraqualfs
Yanush	Loamy-skeletal, siliceous, thermic Typic Paleudalfs
Zafra	Loamy-skeletal, siliceous, thermic Typic Hapludults

* The soil is a taxadjunct to the series. See text for description of those characteristics of the soil that are outside the range of the series.

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