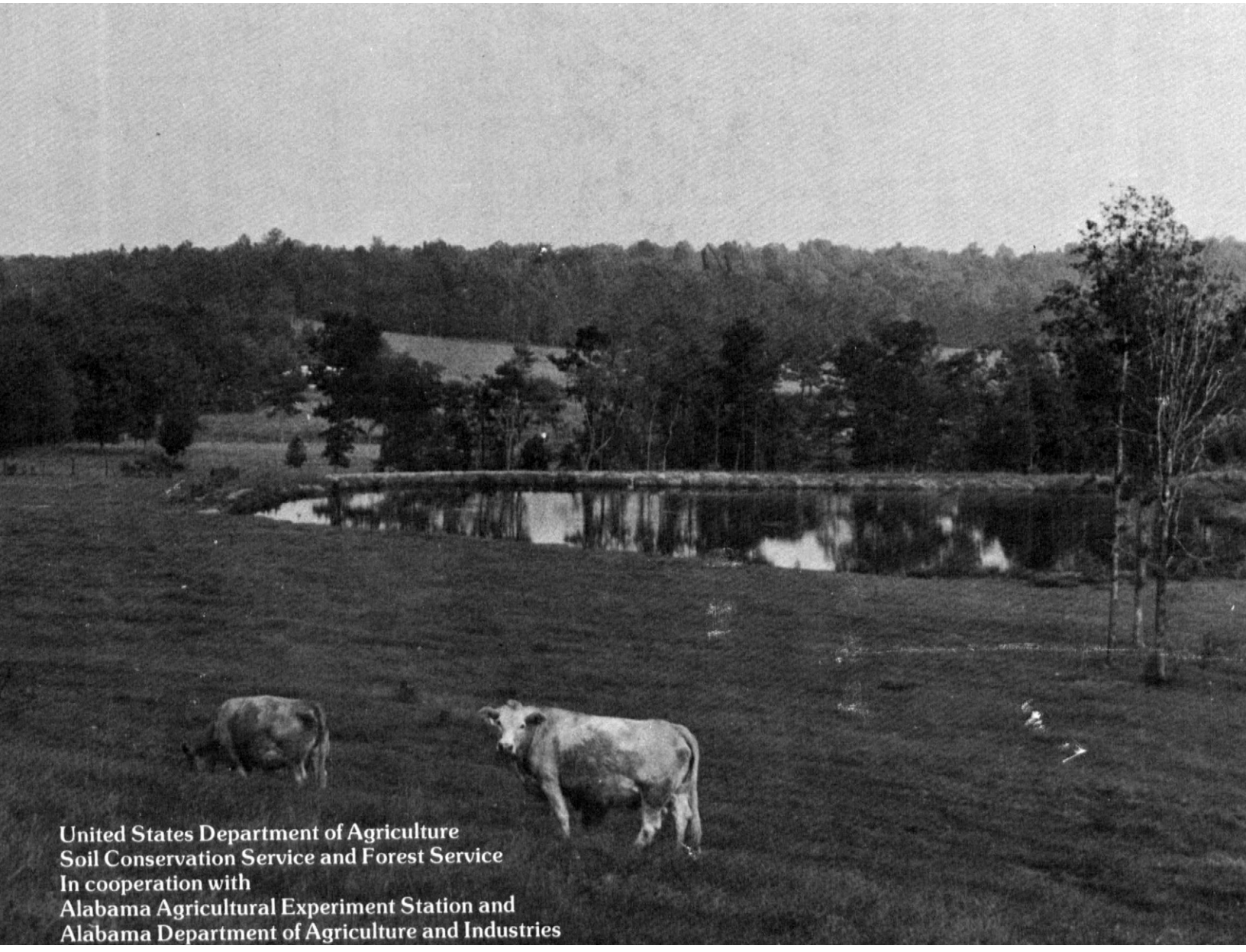
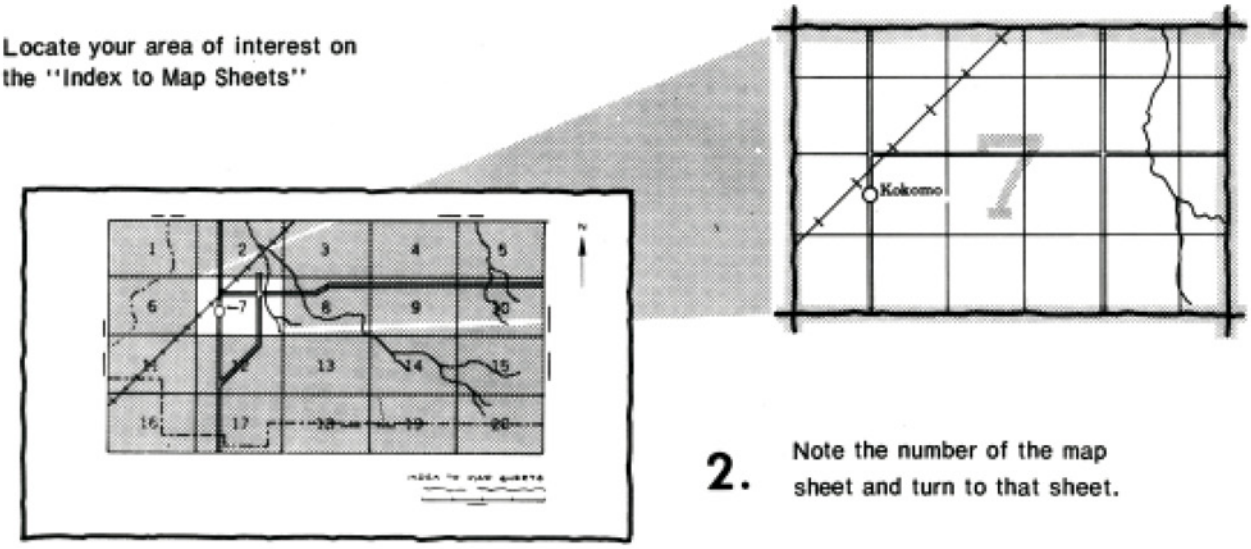
SOIL SURVEY OF
Tuscaloosa County, Alabama



United States Department of Agriculture
Soil Conservation Service and Forest Service
In cooperation with
Alabama Agricultural Experiment Station and
Alabama Department of Agriculture and Industries

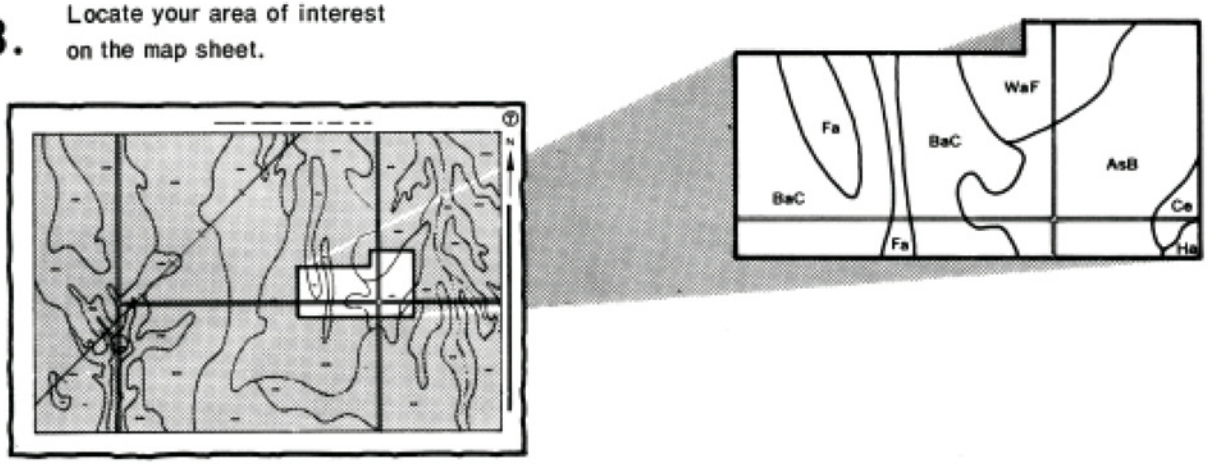
HOW TO USE

1. Locate your area of interest on the "Index to Map Sheets"

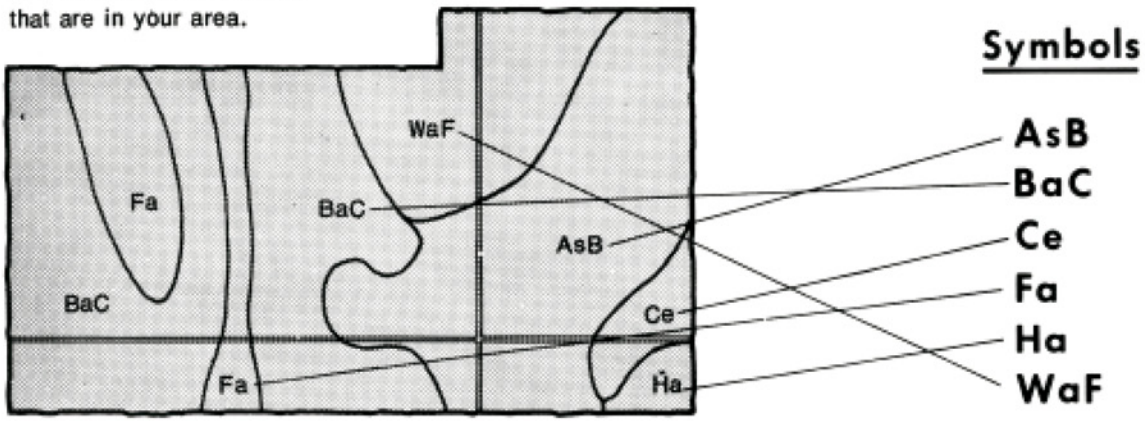


2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.

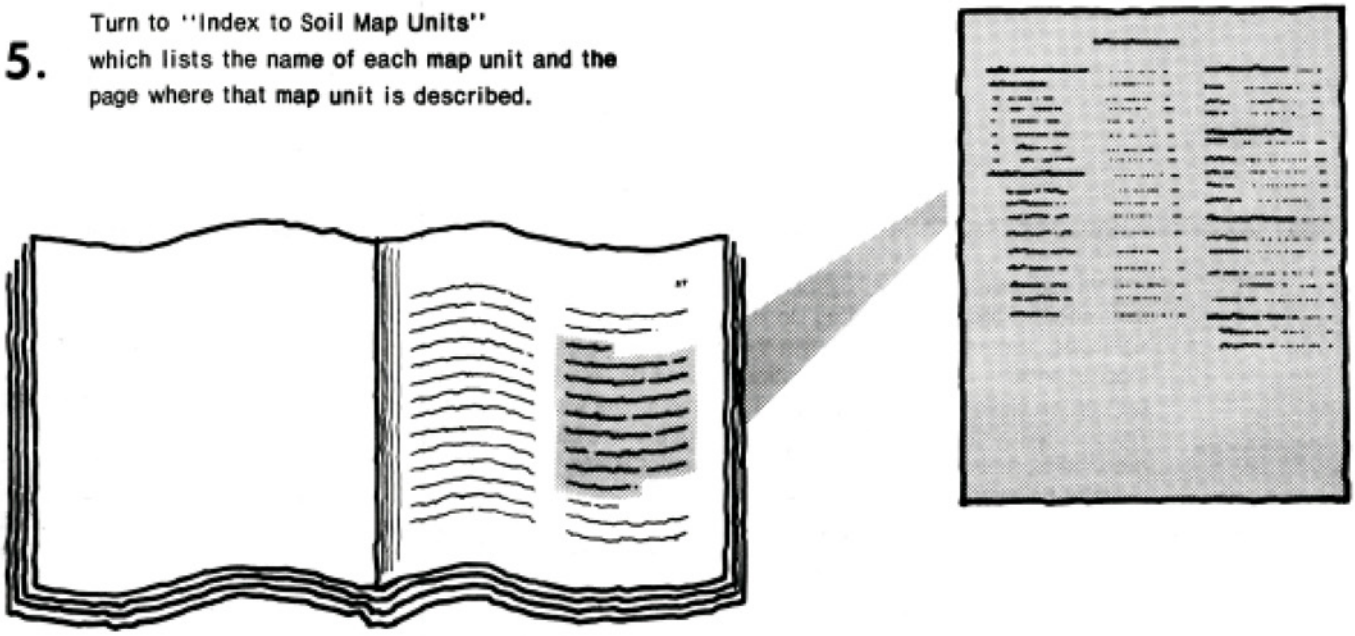


4. List the map unit symbols that are in your area.

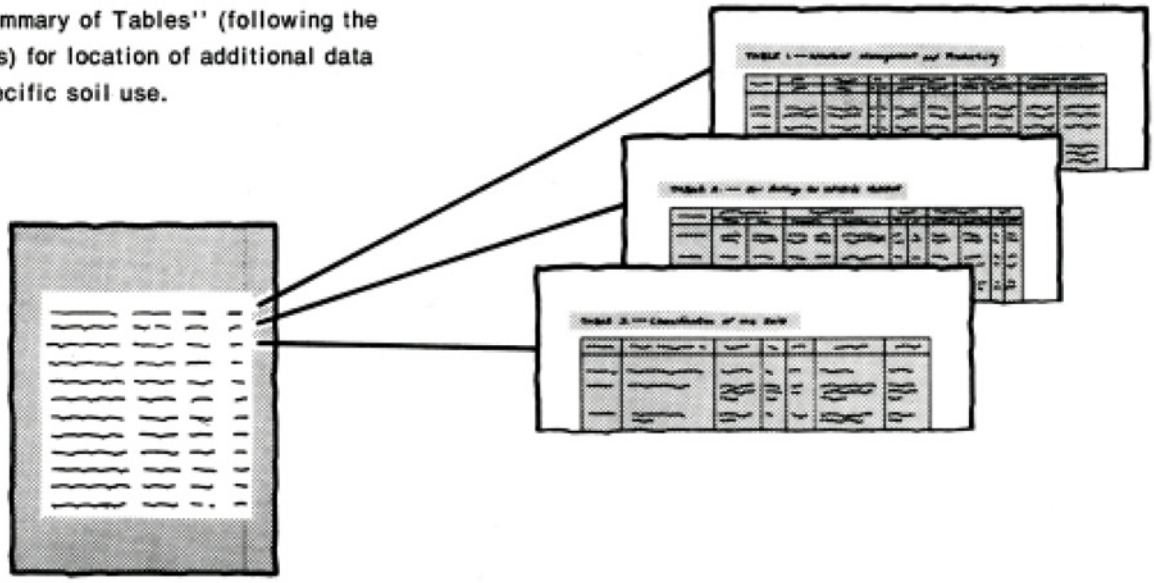


THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



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 performed in the period 1971-1979. Soil names and descriptions were approved in 1980. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1980. This survey was made cooperatively by the Soil Conservation Service and Forest Service, United States Department of Agriculture, the Alabama Agricultural Experiment Station, and the Alabama Department of Agriculture and Industries. It is part of the technical assistance furnished to the Tuscaloosa County Soil and Water Conservation District. The Alabama Cooperative Extension Service furnishes valuable assistance at public educational meetings by distributing and explaining the survey and by providing additional information as necessary.

Cover: This area of Luverne-Smithdale complex, 4 to 10 percent slopes, is used for pasture on a small ranching operation.

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foreword

This soil survey contains information that can be used in land-planning programs in Tuscaloosa County, Alabama. 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.

Ernest V. Todd
State Conservationist
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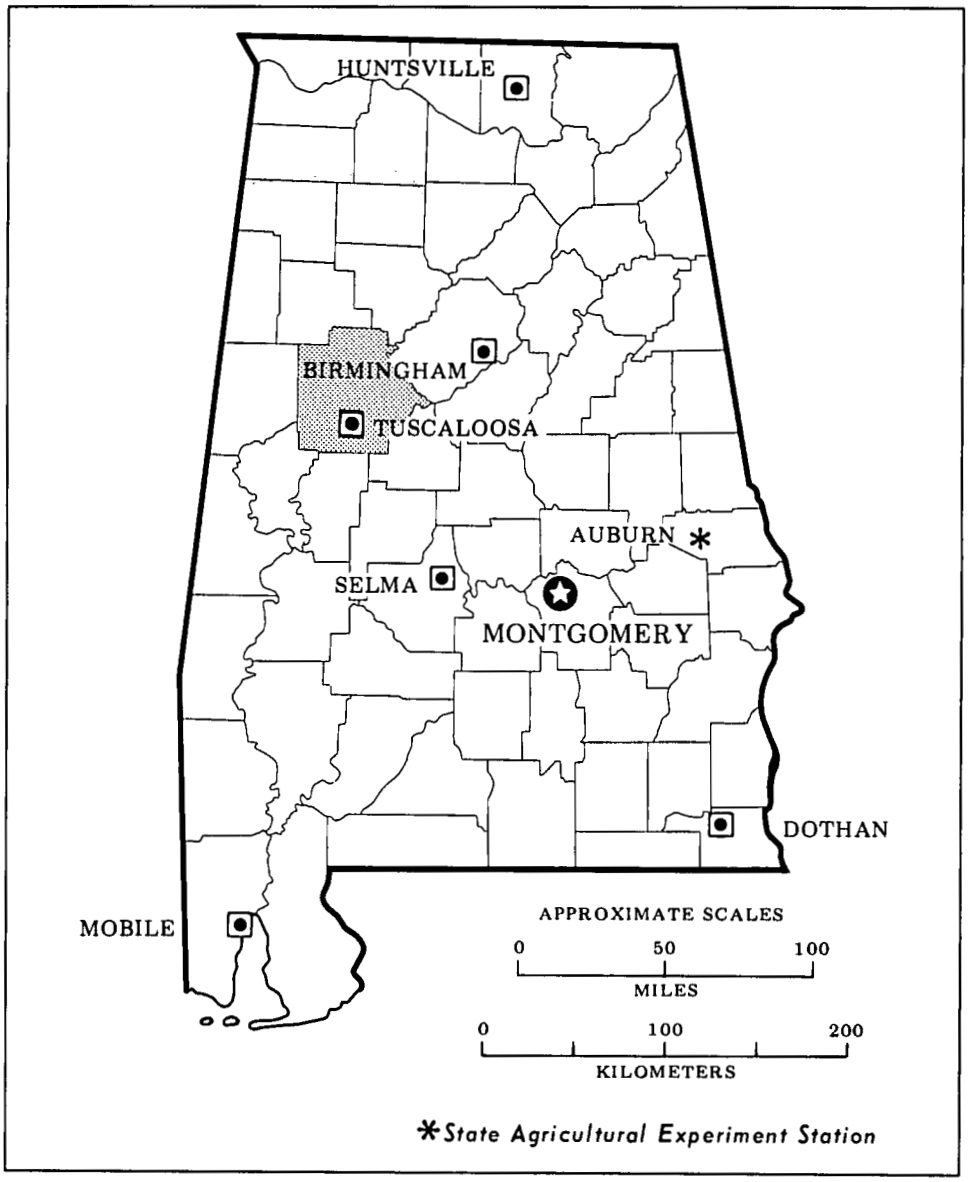

Location of Tuscaloosa County in Alabama.

soil survey of
Tuscaloosa County, Alabama

By Kenneth W. Johnson, Soil Conservation Service

Fieldwork by Kenneth W. Johnson, Johnny C. Trayvick, James C. Cotton, and James E. Boman, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service and Forest Service
in cooperation with
Alabama Agricultural Experiment Station and
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general nature of the county

Tuscaloosa County is in the west-central part of Alabama. Tuscaloosa, the county seat and major urban area, has a population of about 73,228. The city of Northport is across the Black Warrior River from Tuscaloosa and has a population of approximately 12,000. Just east of the city of Tuscaloosa are two smaller, unincorporated communities: Cottondale and Holt. The county has two other incorporated areas: Brookwood and Vance. In the southern part of the county, the town of Moundville projects into Tuscaloosa County.

Tuscaloosa County is in the second tier of counties from the Alabama-Mississippi state line. It is the second largest county in the state, and has an area of 863,360 acres or 1,349 square miles. Tuscaloosa is bounded on the west by Pickens and Greene Counties; on the north by Fayette and Walker Counties; on the east by Walker, Jefferson, and Bibb Counties; and on the south by Bibb, Hale, and Green Counties.

An earlier survey of Tuscaloosa County was published in 1911 (*9*). The present survey updates this earlier survey and provides additional information and more detailed maps.

climate

Prepared by the National Climatic Center, Asheville, North Carolina.

Tuscaloosa County has 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, and prolonged droughts are rare. Summer precipitation, mainly afternoon thunderstorms, is adequate for all crops.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Tuscaloosa, Alabama in the period 1951 to 1973. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 46° F, and the average daily minimum temperature is 35°. The lowest temperature on record, which occurred at Tuscalooosa on January 30, 1966, is 1°. In summer the average temperature is 80°, and the average daily maximum temperature is 91°. The highest recorded temperature, which occurred on July 24, 1952, is 107°.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50° 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 49 inches. Of this, 23 inches, or 45 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 19 inches. The heaviest 1-day rainfall during the period of record was 5.44 inches at

Tuscaloosa on February 21,1961. Thunderstorms occur on about 60 days each year, and most occur in summer.

Average seasonal snowfall is less than 1 inch. The greatest snow depth at any one time during the period of record was 7 inches. On an average, there is seldom a day with at least 1 inch of snow on the ground. The number of such days varies 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 85 percent. The sun shines 60 percent of the time possible in summer and 45 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 9 miles per hour, in winter.

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

history

In 1540 Spanish explorers, led by Hernando De Soto, visited the area. The Spaniards fought a battle with Indians near the Indian capital city of Mauvilla. Thousands of Indians died in that battle, including Chief Tuscaloosa (*16*). The Chief's name is from the Choctaw language and means "Black Warrior." Tuscaloosa and the Black Warrior River were named in his honor.

The first settlers came from the Carolinas in 1816. Tuscaloosa was incorporated in 1819. The State Capitol was moved from Cahaba to Tuscaloosa in 1829, and it remained here until it was moved to Montgomery in 1845 (*4*).

transportation

The county is served by three railroads, all of which intersect within the city of Tuscaloosa. Major highways that cross the county are: Interstate 59 and Interstate 20; U.S. 11 from northeast to southwest; U.S. 82 from southeast to northwest; and U.S. 43, Alabama 69, and Alabama 171 from north to south. All of these highways intersect within the city of Tuscaloosa.

The only major airport within the Tuscaloosa area is Van De Graaf Field. It has a terminal building and a 6,500-foot lighted jet runway. Several commercial airlines utilize these facilities.

The Black Warrior River is the only navigable river that flows through the county. It is part of one of the longest "channelized" river systems in the world and extends from Birmingham to the Gulf of Mexico at Mobile. Several barge companies serve this area by river, mostly transporting coal and raw materials. Grains and other crops, primarily soybeans, are transported southward from Tuscaloosa from state docks at Northport (*16*).

geology

Tuscaloosa County is divided into two approximately equal parts by the "Fall Line," which extends roughly from the northwest to the southeast corner. The Fall Line was the coast line of the ocean from a previous epoch. Numerous cities throughout the southwest are located on the Fall Line. This marks the point where smooth waters of the river once encountered rough waters which prohibited navigation.

South of the Fall Line is the Gulf Coastal Plain, which makes up about one-third of the county. The Gulf Coastal Plain is level to gently rolling hills and terraces. Terraces are extensive in the Gulf Coastal Plain part of the county, and several are as high as 300 feet above the river. Other low terraces flank the flood plains.

The Sand Mountain Land Resource Area lies above the Fall Line in the northeastern part of the county and makes up the terminus of the Appalachian Mountains. The plateau is steep, rough terrain. Streams are in steep-sided valleys, which often form gorges. Drainage patterns are dendritic. Streams have cut deeply into the landscape and have narrow valleys within layers of alluvial material. Elevation varies from 150 to 750 feet above sea level.

The eastern to northeastern part of the county is in the Southern Appalachian Ridges and Valleys, which runs northeast to southwest. This area is not extensive in Tuscaloosa County, but the nearby city of Birmingham has been greatly influenced by this geologic structure. Stream patterns are somewhat trellised, and streams tend to be deeply cut and have narrow flood plains. Elevation varies between 100 to 450 feet above sea level.

natural resources

Minerals—Brown iron ore (limonite) and Red iron ore (hematite) are in the northeastern part of the county and have been mined extensively.

The Tuscaloosa area is well supplied with sand and gravel deposits that are now being mined. Dredging the Black Warrior River has yielded large amounts of gravel. Sand and gravel deposits are well distributed throughout the Gulf Coastal Plain part of the county.

Pottery clay is abundant, and several small pottery plants use it. Refractory clays from beneath coal seams are mined and delivered to refractory plants in nearby Birmingham.

Limestone occurs in the eastern part of the county from Vance northeastward, but it has been little utilized so far. Sandstone crops out along the Black Warrior River and its major tributaries in the northeastern part of the county.

Shale, an abundant sedimentary rock composed of clay minerals, has been found in the coalfields immediately north of Tuscaloosa. Some of these shales have been tested for light weight aggregate and have been found to bloat successfully.

Both strip mining and underground mining of coal occur in the county. Large deposits of coal are present throughout the northeastern part of the county (*12*).

Water—Tuscaloosa County has an abundant supply of water both above and below ground. There are two major lakes and numerous private lakes and ponds in the county. The major lakes are Lake Tuscaloosa (over 5,000 surface acres of water) and Lake Lurleen (250 surface acres of water).

Most of the county has adequate water for domestic use. The Tuscaloosa Formation and the underlying Pottsville Formation are good aquifers that supply an abundance of water with dug or drilled wells (*1*). There are many springs in the county in which water is supplied by a sand and gravel layer in the Tuscaloosa Formation or by subsoil storage in the hillsides of the Pottsville Formation (*12*).

Forests—There are approximately 696,000 acres of forest land in the county. Forests cover about 81 percent of the land area.

Farming—Cotton was the primary crop for early farmers in Tuscaloosa County. Corn was a secondary crop, grown mainly for domestic livestock.

By the early 1900's soil erosion, insects, and acreage control began to significantly decrease the acreage and yields of cotton in the county. This brought about an increase in beef cattle production and dairying because much of the eroded land was planted to hay and pasture.

During the late 1960's, soybeans were planted on land formerly used for cotton and pastureland. During the mid 1970's, soybeans became the major crop in the county. At present, soybeans utilize the greatest acreage of the county's cropland. However, beef cattle are beginning to increase again. Dairying has continued to decrease over the years. At present, there are fewer than 10 dairies in the county. Hog and poultry production, especially through controlled feeding programs, has steadily increased over the past few years (*12*).

how this survey was made

Soil scientists made this survey to learn what soils are in the survey area, where they are, and how they can be used. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; and the kinds of rock. They dug many holes to study soil profiles. A profile is the sequence of natural layers, or horizons, in a soil. It extends from the surface down into the parent material, which has been changed very little by leaching or by plant roots.

The soil scientists recorded the characteristics of the profiles they studied and compared those profiles with others in nearby counties and in more distant places. They classified and named the soils according to nationwide uniform procedures. They drew the boundaries of the soils on aerial photographs. These photographs show trees, buildings, fields, roads, and other details that help in drawing boundaries accurately. The soil maps at the back of this publication were prepared from aerial photographs.

The areas shown on a soil map are called map units. Most map units are made up of one kind of soil. Some are made up of two or more kinds. The map units in this survey area are described under "General soil map units" and "Detailed soil map units."

While a soil survey is in progress, samples of some soils are taken for laboratory measurements and for engineering tests. All soils are field tested to determine their characteristics. Interpretations of those characteristics may be modified during the survey. Data are assembled from other sources, such as test results, records, field experience, and state and local specialists. For example, data on crop yields under defined management are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it can be used by farmers, rangeland and woodland managers, engineers, planners, developers and builders, home buyers, and others.

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 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.

soil descriptions

1. Adaton-Ellisville-Dundee

Deep, nearly level, poorly drained, well drained, and somewhat poorly drained soils that have a loamy subsoil; formed in fluvial deposits

This map unit is entirely within the flood plain of the Black Warrior River and Big Sandy Creek, south of Tuscaloosa.

This unit makes up about 7 percent of the county. It is about 35 percent Adaton soils, 16 percent Ellisville soils, 14 percent Dundee soils, and 35 percent soils of minor extent.

Adaton soils are poorly drained. Ellisville soils are well drained but are frequently flooded and at a much lower elevation below an escarpment bank. Dundee soils are somewhat poorly drained and are adjacent to Adaton soils. Adaton and Dundee soils are soft and compressible when wet, but Ellisville soils are fairly stable. All of these soils have a silt loam surface layer.

Of minor extent are the moderately well drained Falkner soils and the well drained Cahaba and Choccolocco soils, which are at a slightly higher elevation.

The soils in this unit are mainly used for cultivated crops. Most of the acreage has been cleared and drained. There are some undrainable swampy areas, however, and these areas are mostly Adaton soils. Wetness and flooding are the main limitations for farming and for most other uses.

If adequately drained, the soils in this unit are well suited to cultivated crops, pasture, and woodland. Wetness is such a severe limitation in some areas and so difficult to overcome that these soils are poorly suited to residential and other urban uses. The soils in this unit are well suited to development as wetland wildlife habitat.

2. Montevallo-Nauvoo

Shallow and deep, moderately steep and steep, well drained soils that have a dominantly loamy subsoil; formed from material weathered from siltstone, sandstone, shale, and interbedded sandstone and shale

Areas of these soils are scattered throughout the northeastern part of the county. The landscape consists of highly dissected uplands that have narrow, winding ridgetops, steep hillsides, and narrow bottoms along the streams.

This map unit makes up about 30 percent of the county. It is about 40 percent Montevallo soils, 35 percent Nauvoo soils, and 25 percent soils of minor extent.

In most mapped areas, Montevallo soils are at a slightly lower elevation than Nauvoo soils. Montevallo and Nauvoo soils are well drained. Montevallo soils have a silt loam surface layer, and Nauvoo soils have a fine sandy loam surface layer.

Of minor extent are the well drained Smithdale and Pikeville soils on ridgetops and upper side slopes and the somewhat excessively drained Brilliant soils on mined areas.

The soils in this unit are mainly used as woodland, but some tracts are used for pasture. A few areas in the northern part of the county are used for cultivated crops. Depth to rock and steep slopes are the main limitations of these soils for farming and for most forestry uses. These soils are fairly suited to pasture and woodland and are poorly suited to cultivated crops in most areas.

Depth to rock and slope are such severe limitations and so difficult to overcome that these soils are poorly suited to residential and other uses. The soils in this unit are well suited to development as woodland wildlife habitat.

3. Bama-Smithdale-Shatta

Deep, nearly level to sloping, well drained and moderately well drained soils that have a loamy subsoil; formed in thick beds of loamy marine sediments

These nearly level to sloping soils are on broad upland ridgetops, benches, and plateaus scattered throughout the central, southern, and western parts of the county.

This map unit makes up about 12 percent of the county. It is about 34 percent Bama soils, 34 percent Smithdale soils, 14 percent Shatta soils, and 18 percent soils of minor extent.

Bama and Shatta soils are in slightly higher positions on the landscape than the Smithdale soils. Bama and Smithdale soils are well drained, and Shatta soils are moderately well drained. Both Bama and Smithdale soils have a surface layer of fine sandy loam and a water table that is at a depth of more than 60 inches. Shatta soils have a silt loam surface layer and a perched water table during winter months.

Of minor extent are the well drained Ruston soils, the moderately well drained Iuka soils, the somewhat poorly drained Mantachie soils, the poorly drained Bibb soils, and urban land areas of the Bama, Smithdale, and Shatta soils.

The soils in this unit are mainly used for cultivated crops. Cotton and soybeans are dominant, but some tracts are used for pasture, woodland, and urban areas. Urban areas include parts of the cities of Tuscaloosa and Northport.

The soils in this area are well suited to cultivated crops, pasture, and woodland. Slope may be a limitation, however, in some areas of the Smithdale soils. These soils are well suited to most urban uses. Woodland areas are well suited to development as woodland wildlife habitat.

4. Allen-Bodine-Decatur

Deep, gently sloping to steep, well drained and somewhat excessively drained soils that have a loamy or clayey subsoil; formed in loamy residuum of weathered limestone and chert

These sloping to steep soils are in the extreme eastern part of the county. The landscape is mainly narrow ridgetops, rolling side slopes, and narrow drainageways.

This map unit makes up about 2 percent of the county. It is about 29 percent Allen soils, 20 percent Bodine soils, 13 percent Decatur soils, and 38 percent soils of minor extent.

Allen and Decatur soils are slightly higher in elevation than the Bodine soils. Allen soils have a surface layer of fine sandy loam, and Bodine and Decatur soils have a surface layer of loam.

Of minor extent are the frequently flooded Iuka and Mantachie soils; the well drained, shallow Montevallo soils and deep Nauvoo soils; and the Palmerdale soils that formed in mine spoil.

The soils in this unit are mainly used for woodland and urban development, but some tracts are used for pasture and vegetable gardens.

The soils in this unit are poorly suited to cultivated crops and fairly suited to pasture and to use as woodland. The soils are poorly suited to urban uses because of steep slopes and stoniness (fig. 1). These soils are well suited to development as woodland wildlife habitat.

5. Smithdale-Palmerdale-Pikeville

Deep, rolling to steep, well drained and somewhat excessively drained soils that have a loamy subsoil; formed in thick beds of loamy and gravelly marine sediments and mine spoil materials

Areas of these soils are mainly in the north-central and eastern parts of the county. The landscape is mainly highly dissected uplands that have narrow, winding ridgetops; steep hillsides; and narrow bottoms along the streams.

This map unit makes up about 16 percent of the county. It is about 48 percent Smithdale soils, 11 percent Palmerdale soils, 7 percent Pikeville soils, and 34 percent soils of minor extent.

Smithdale soils are generally in slightly higher positions on the landscape than the Pikeville soils. Both are well drained and have a surface layer of fine sandy loam. Palmerdale soils are somewhat excessively drained and have a surface layer of shaly loam.

Of minor extent are the excessively drained, gravelly Flomaton soils, the shallower Montevallo and Nauvoo soils, the moderately well drained Iuka soils, and the somewhat poorly drained Mantachie soils.

The soils in this unit are mainly used as woodland and are well suited to this use. Some small areas, however, are used for cultivated crops and pasture. These soils are poorly suited to cultivated crops and fairly suited to pasture. The steepness and irregular shape of slopes and the severe hazard of erosion are the main limitations for using these soils for cultivated crops.

These soils are fairly suited to most urban uses because of the steep slopes. The soils are well suited to development as woodland wildlife habitat.

6. Smithdale-Luverne

Deep, sloping to steep, well drained soils that have a loamy or clayey subsoil; formed in marine sediments deposited as stratified sands, silts, and clays

Areas of these soils are scattered throughout the western and southeastern parts of the county. The area is highly dissected uplands with narrow, winding ridgetops, steep hillsides, and narrow bottoms along streams.

This map unit makes up about 30 percent of the county. It is about 45 percent Smithdale soils, 25 percent Luverne soils, and 30 percent soils of minor extent.

Figure 1.—An area of the Allen-Bodine-Decatur general soil map unit, which is mainly used for pasture and woodland.

Smithdale soils are generally in slightly higher positions on the landscape than Luverne soils and are mainly on ridgetops. Smithdale and Luverne soils have a surface layer of fine sandy loam.

Of minor extent are the gravelly Flomaton and Pikeville soils, the moderately well drained and clayey Boswell soils, and the frequently flooded Iuka, Mantachie, and Bibb soils along streams.

The soils in this unit are suited to use as woodland. Areas of this unit are mainly used as woodland. Some small areas are used for cultivated crops, such as corn and soybeans, or for pasture and hayland. The soils are poorly suited to cultivated crops and fairly suited to pasture. The steepness and irregular shape of slopes are the main limitations for using these soils for cultivated crops.

The soils in this unit are poorly suited to residential and other urban uses. The moderate shrink-swell potential and low strength of the Luverne soils and the steepness of slopes are the main limitations for urban uses. In addition, Luverne soils have moderately slow permeability, which is a severe limitation for septic tank absorption fields. These soils are well suited to development as woodland wildlife habitat.

7. Augusta-Amy

Deep, nearly level, somewhat poorly drained and poorly drained soils that have a loamy subsoil; formed in fluvial deposits

These nearly level soils are on low stream terraces and sloughs of the Sipsey River in the western part of the county.

This map unit makes up about 3 percent of the county. It is about 74 percent Augusta soils, 20 percent Amy soils, and 6 percent soils of minor extent.

Augusta soils are at a slightly higher elevation than the Amy soils, which are in sloughs and depressions. Augusta soils are somewhat poorly drained. The Amy soils are poorly drained and are often ponded for long periods. Augusta soils have a loam surface layer, and Amy soils have a silt loam surface layer. Both soils have a seasonal high water table.

Of minor extent are the somewhat poorly drained Mantachie soils; the moderately well drained Iuka, Falkner, and Shatta soils; and the well drained Cahaba soils.

The soils in this unit are mainly used as woodland (fig. 2). They are well suited to wetland hardwoods. Some small tracts are used for pasture and cultivated crops. The cultivated crops are usually soybeans and small grains.

The soils in this unit are poorly suited to cultivated crops because of frequent flooding and wetness. These soils are fairly suited to pasture because of wetness, which limits the variety of plant species and is more difficult to manage.

Flooding, wetness, and ponding are severe limitations for urban uses. These soils are well suited to development as wetland and woodland wildlife habitat.

broad land use considerations

Deciding which land should be used for urban development is an important issue in the survey area. Each year a considerable amount of land is being developed for urban uses in Tuscaloosa, Northport, and other towns in the county. It is estimated that about 14,000 acres is urban or built-up land. The general soil map is most helpful for planning the general projected growth of urban areas, but it should not be used for the selection of sites for specific urban structures. In general, the soils in the survey area that are well suited to cultivated crops also are well suited to urban development. Information about specific soils in this survey can be helpful in planning future land use patterns.

Areas of soils that have unfavorable characteristics for urban development are extensive in Tuscaloosa County. The Montevallo-Nauvoo general soil map unit and large parts of the Allen-Bodine-Decatur unit are poorly suited

Figure 2.—An area of the Augusta-Amy general soil map unit, which is flooded frequently.

to urban uses because of depth to rock and steep side slopes. The soils of the Smithdale-Luverne unit have high shrink-swell potential, low strength, and slow permeability. The soils of the Adaton-Ellisville-Dundee map unit are on flood plains, and flooding and wetness are severe limitations. Frequent flooding and wetness are severe limitations for urban uses on the soils in the Augusta-Amy map unit.

The Bama-Smithdale-Shatta map unit is generally well suited to urban development, but the wetness and slow permeability of the Shatta soils are limitations for septic tank absorption fields.

Each year strip mining takes hundreds of acres of the Montevallo-Nauvoo and the Smithdale-Palmerdale-Pikeville map units out of timber production. Though a large percentage of this acreage is replanted to pine trees, it does not equal the production of undisturbed soils. It is estimated that over 22,000 acres of land in Tuscaloosa County has been strip mined.

The Adaton-Ellisville-Dundee and the Bama-Smithdale-Shatta map units are well suited to farming. Cultivated crops, hay, and pasture are grown. The Montevallo-Nauvoo and the Smithdale-Palmerdale-Pikeville map units are poorly suited to farming because of steep side slopes, narrow ridgetops, depth to rock, and stoniness. The Allen-Bodine-Decatur, Smithdale-Luverne, and Augusta-Amy map units are fairly suited to farming. Some areas of the Allen-Bodine-Decatur and Smithdale-Luverne map units have steep side slopes and narrow ridgetops. The Augusta-Amy map unit is flooded frequently and has a seasonal high water table.

Most of the county, with the exception of the Montevallo-Nauvoo map unit, is fairly suited to well suited to use as woodland and for timber production. The large amounts of shale fragments and the depth to rock of the Montevallo soils are limitations.

The Bama-Smithdale-Shatta, Allen-Bodine-Decatur, and Smithdale-Luverne map units are well suited to use as sites for parks and extensive recreation areas. Undrained marshes and swamps of the Augusta-Amy and Adaton-Ellisville-Dundee map units are suited to use as nature study areas. All of the general soil map units provide habitat for many important species of wildlife.

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, Bama fine sandy loam, 2 to 6 percent slopes, is one of several phases in the Bama series.

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

A *soil complex* consists of areas of two or more soils or areas of soils and miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils and miscellaneous areas are somewhat similar in all areas. Luverne-Smithdale complex, 4 to 10 percent slopes, and Bama-Urban land complex, 0 to 2 percent slopes, are examples.

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. Montevallo-Nauvoo association, steep, is an example.

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

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major 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. Pits 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 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

soil descriptions

2—Adaton silt loam. This deep, poorly drained soil is on low stream terraces of the major streams in the county. The largest acreage is along the Black Warrior River. Most areas are subject to rare flooding. Slopes range from 0 to 2 percent. Individual areas range from about 10 to 2,300 acres.

Typically, the surface layer is dark gray silt loam about 2 inches thick. The subsurface layer is grayish brown silt loam to a depth of 7 inches. The upper part of the subsoil is light gray, mottled silt loam that extends to a depth of 31 inches. The lower part of the subsoil is mottled yellow, brown, and gray silty clay loam to a depth of 79 inches. The underlying material is light brownish gray loam to a depth of 96 inches or more.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout, unless the surface layer has been limed. Permeability is slow, and available water capacity is high. This soil is subject to rare flooding during periods of abnormally high rainfall. Tilth is fair, and the soil can be worked only through a narrow range in moisture content. If this soil is wet, it does not afford traction or support for farm equipment. The root zone is deep, but plant roots are somewhat restricted by a seasonal high water table at or near the surface during winter and early in spring.

Included with this soil in mapping are a few areas of Dundee, Falkner, and Shatta soils. Included soils make up about 10 percent of this map unit.

Most of this Adaton soil is used as woodland. Some areas have been cleared, drained, and planted to soybeans. Drainage systems for cultivated crops, however, are generally costly to install and maintain.

Undrained areas of this soil are poorly suited to most cultivated crops commonly grown because of wetness and ponding after heavy rains. This soil is fairly suited to pasture and hay. Wetness limits the variety of plant species in pasture, and stands are difficult to maintain.

This soil is well suited to broadleaf trees. Suitable species are sweetgum and loblolly pine. The water-tolerant broadleaf species are better suited because of wetness. The equipment limitation and plant competition are severe because of wetness. The equipment limitation can be overcome by logging during drier seasons.

This soil is well suited to use as woodland wildlife habitat. Some wetland wildlife can be supported in ponded areas.

The soil is poorly suited to urban uses because of wetness and flooding. These limitations are very difficult to overcome.

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

3—Allen-Bodine complex, 8 to 15 percent slopes. This map unit consists of small areas of Allen and Bodine soils that are so intermingled that it was not practical to map them separately. These are deep, well drained and somewhat excessively drained soils on side slopes and narrow ridgetops. Slopes range from 8 to 15 percent. Individual areas range from 200 to 500 acres.

Allen fine sandy loam makes up about 65 percent of the map unit. Typically, the surface layer is brown fine sandy loam about 4 inches thick. The subsurface layer, to a depth of 9 inches, is yellowish brown loam. The upper part of the subsoil, to a depth of 15 inches, is yellowish red loam and, to a depth of 46 inches, yellowish red sandy clay loam. The lower part is red sandy clay loam to a depth of 60 inches or more.

This Allen soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid. Permeability and available water capacity are moderate. The root zone is deep and easily penetrated by plant roots.

Bodine loam makes up about 25 percent of the map unit. Typically, the surface layer is very dark grayish brown cherty loam about 5 inches thick. The subsurface layer, to a depth of 15 inches, is light yellowish brown cherty loam. The upper part of the subsoil is yellowish brown cherty loam to a depth of 21 inches. The lower part is yellowish red very cherty clay loam to a depth of 53 inches and very cherty loam to a depth of 62 inches or more.

This Bodine soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid. Permeability is moderately rapid, and available water capacity is low. The root zone is deep; however, because of excessive amounts of chert fragments, it is difficult for roots to penetrate in most areas.

Included with these soils in mapping are small areas of a cherty soil that contains more clay in the subsoil than the Allen and Bodine soils. Also included are small areas of Decatur soils. Included soils make up about 10 percent of the map unit.

Most of the soils in this unit are used as woodland. A few areas are used for cultivated crops and pasture.

The Allen and Bodine soils are fairly suited to cultivated crops, pasture, and hay. Chert fragments in the Bodine soils and abrupt slopes are limitations for cultivated crops and hay production. Erosion is a hazard if extensive cultivation is practiced, but terraces and cover crops slow runoff and help reduce erosion.

These soils are fairly suited to use as woodland. Most of the acreage is loblolly pine and mixed species of upland oaks. The hazard of erosion is slight. The equipment limitation and seedling mortality are moderate in some cherty areas. The soils in this map unit are well suited to use as woodland wildlife habitat and for some recreational activities.

These soils are poorly suited to most urban uses. Slope is the only apparent limitation.

Both soils in this complex are in capability subclass IIIe. The Allen soil is in woodland group 3o, and the Bodine soil is in woodland group 3f.

4—Augusta-Amy complex, frequently flooded. This map unit consists of areas of Augusta and Amy soils that are so intermingled that it was not practical to map them separately. These deep, somewhat poorly drained to poorly drained, frequently flooded soils are on flood plains and low stream terraces of the Coastal Plain. Amy soils are in sloughs and depressional areas, and Augusta soils are on low lying stream terraces. Slopes range from 0 to 2 percent. Individual areas range from 30 to 100 acres; however, one area along the Sipsey River exceeds 28,000 acres.

About 75 percent of the map unit is Augusta soil. Typically, the surface layer is dark brown loam about 5 inches thick. The subsurface layer is light yellowish brown loam to a depth of 9 inches. The upper part of the subsoil is light yellowish brown, mottled clay loam to a depth of 24 inches. The lower part is light brownish gray,

mottled clay to a depth of 59 inches. The underlying material is dark yellowish brown sandy loam.

The Augusta soil is low in natural fertility and organic matter content. Reaction ranges from medium acid to very strongly acid. Permeability is moderate, and available water capacity is high. The water table is seasonally high. It is at a depth of 18 inches during winter and early in spring. The root zone is deep, but plant roots are somewhat restricted by the high water table.

About 20 percent of the map unit is Amy soil. Typically, the surface layer is grayish brown silt loam about 5 inches thick. The subsurface layer is light brownish gray silt loam to a depth of 14 inches. The upper part of the subsoil is light gray, mottled silt loam to a depth of 31 inches. The lower part is mottled gray and light brownish gray silty clay loam that extends to a depth of 48 inches. The underlying material is mottled gray, light brownish gray, and pale brown loam.

The Amy soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid. Permeability is slow, and available water capacity is high. The water table is seasonally high. It is at a depth of 12 inches during winter and early in spring. The root zone is deep, but plant roots are somewhat restricted by the high water table.

Included with these soils in mapping are small areas of Mantachie and Shatta soils. Shatta soils are moderately well drained, and Mantachie soils are somewhat poorly drained. These included soils make up about 5 percent of the map unit.

Most areas of these soils are used as woodland. Frequent flooding restricts almost any other use.

The Augusta and Amy soils are not suited to cultivated crops and are poorly suited to pasture and hay. Frequent flooding and wetness are limitations for these uses. These limitations are difficult and expensive to overcome.

The soils in this unit are well suited to water oak, green ash, blackgum, and loblolly pine. Wetness is the main limitation for using equipment in managing and harvesting the tree crop. This limitation can be partly overcome by logging during drier seasons. These soils are well suited to use as wetland and woodland wildlife habitat.

Wetness and flooding are severe limitations for urban uses. These limitations can be overcome only by major flood control and drainage measures.

Both soils in this complex are in capability subclass Vw and woodland group 2w.

5—Bama fine sandy loam, 0 to 2 percent slopes. This deep, well drained soil is on Coastal Plain uplands. Slopes range from 0 to 2 percent. Individual areas range from 10 to 150 acres.

Typically, the surface layer is brown fine sandy loam about 5 inches thick. The subsoil, to a depth of 72 inches or more, is red and yellowish red and ranges from sandy clay loam to loam.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout, unless the surface layer has been limed. Permeability is moderate, and available water capacity is moderate. Tilth is good, and the soil can be worked throughout a wide range in moisture content. The root zone is deep and easily penetrated by plant roots. Runoff is slow to medium.

Included with this soil in mapping are soils in concave areas that have a yellowish brown subsoil. Other soils on a few knolls and plateaus have a dark red surface layer. Also included are a few areas of Shatta, Luverne, Boswell, and Smithdale soils. These included soils make up 15 to 20 percent of the map unit.

This Bama soil is mainly used for cultivated crops and pasture, although some areas remain in woodland.

Cultivated crops, pasture, and hay are well suited to this soil. Cotton and soybeans are commonly grown. Pasture grasses generally consist of bahiagrass or coastal bermudagrass. Some areas are used for vegetable crops and small gardens.

Loblolly pine and longleaf pine are well suited to this soil. There are no significant limitations for woodland use or management. This soil is well suited to use as woodland wildlife habitat. It is well suited to urban uses and has no significant limitations.

This Bama soil is in capability class I and woodland group 3o.

6—Bama fine sandy loam, 2 to 6 percent slopes. This deep, well drained soil is on Coastal Plain uplands. Slopes range from 2 to 6 percent. Individual areas range from 10 to 1,200 acres.

Typically, the surface layer is brown fine sandy loam about 5 inches thick. The subsoil, to a depth of 72 inches or more, is red and yellowish red and ranges from sandy clay loam to loam.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout, unless the surface layer has been limed. Permeability and available water capacity are moderate. Tilth is good, and the soil can be worked throughout a wide range in moisture content. The root zone is deep and easily penetrated by plant roots. Runoff is medium.

Included with this soil in mapping are soils in concave areas that have a yellowish brown subsoil. Other soils on a few knolls and plateaus have a dark red surface layer. Also included are a few areas of Boswell, Luverne, Ruston, and Smithdale soils. The included soils make up 5 to 20 percent of this map unit.

This Bama soil is mainly used for cultivated crops and pasture, although some small areas are used for woodland. The soil is well suited to cultivated crops, pasture, and hay. The hazard of erosion is moderate if cultivated crops are grown. Terraces, minimum tillage, and cover crops can help slow runoff and control erosion.

Longleaf and loblolly pines are well suited to this soil. There are no significant limitations for woodland use or

management. This soil is well suited to use as woodland wildlife habitat. It is well suited to most urban uses and has no significant limitations.

The Bama soil is in capability subclass IIe and woodland group 3o.

7—Bama-Urban land complex, 0 to 2 percent slopes. This map unit consists of Bama soil and Urban land in small areas that are so intermingled that it was not practical to map them separately. This well drained soil is on broad ridgetops and plateaus of the Coastal Plain uplands. Slopes are smooth and convex. They range from 0 to 2 percent. Individual areas range from 40 to 200 acres.

Bama fine sandy loam makes up about 50 percent of each mapped area. Typically, the surface layer is brown fine sandy loam about 5 inches thick. The subsoil, to a depth of 72 inches or more, is red and yellowish red and ranges from sandy clay loam to loam. In many areas the soil has been significantly disturbed or modified by filling, cutting, or grading.

The Bama soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout, unless the surface layer has been limed. Permeability and available water capacity are moderate. The root zone is deep and easily penetrated by plant roots.

Urban land makes up about 40 percent of each mapped area. It consists of areas that are covered by sidewalks, patios, driveways, parking lots, streets, and buildings, such as schools, churches, homes, offices, and industrial plants.

Included with this complex in mapping are a few small areas of Shatta soils and a few areas that have slopes of more than 2 percent. Included soils make up about 10 percent of this map unit.

The Bama soil is well suited to vegetable gardens and plants normally used in landscaping.

This soil is well suited to most recreation uses. There are no significant limitations for most other uses. This soil is well suited to most engineering uses. The risk of corrosion of uncoated concrete is moderate. The Bama soil is well suited to most urban uses. Low strength is a moderate limitation if the soil is used for local roads and streets. This limitation generally can be overcome by proper engineering design.

This complex is not in a capability subclass or woodland group.

8—Bama-Urban land complex, 2 to 6 percent slopes. This map unit consists of Bama soil and Urban land in small areas that are so intermingled that it was not practical to map them separately. This well drained soil is on broad ridgetops and plateaus of the Coastal Plain uplands. Slopes are smooth and convex. They range from 2 to 6 percent. Individual areas range from 30 to 300 acres.

Bama fine sandy loam makes up about 50 percent of each mapped area. Typically, the surface layer is brown fine sandy loam about 5 inches thick. The subsoil, to a depth of 72 inches or more, is yellowish red and red and ranges from sandy clay loam to loam. In many areas the soil has been significantly disturbed or modified by cutting, filling, or grading.

This Bama soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout, unless the surface layer has been limed. Permeability and available water capacity are moderate. The root zone is deep and easily penetrated by plant roots.

Urban land makes up about 45 percent of each mapped area. It consists of areas that are covered by sidewalks, patios, driveways, parking lots, and streets and buildings, such as schools, churches, offices, homes, and industrial plants.

Included with this complex in mapping are a few small areas of Shatta and Smithdale soils. Included soils make up about 5 percent of this map unit.

The Bama soil is well suited to most recreation uses. Slopes, however, are moderate limitations for playgrounds. There are no significant limitations for most other recreation uses.

This soil is well suited to most engineering uses. The risk of corrosion of uncoated concrete is moderate. The soil is well suited to most urban uses. Slope and low strength are moderate limitations for industrial uses and for local roads and streets. These limitations generally can be overcome by proper engineering design.

This complex is not in a capability subclass or a woodland group.

9—Bibb soils, frequently flooded. These deep, poorly drained soils are on flood plains of streams in the Coastal Plain. These soils are frequently flooded and are subject to scouring and uneven deposition of overwash. Slopes range from 0 to 2 percent. Individual areas range from 20 to 80 acres.

Typically, the surface layer is dark brown sandy loam about 10 inches thick. The underlying material is gray, mottled loam, fine sandy loam, and loamy sand.

These soils are low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability is moderate, and available water capacity is high. The root zone is deep, but roots are somewhat restricted by a seasonal high water table late in fall and early in spring. These soils are flooded several times each year.

Included with these soils in mapping are natural levees of stratified sandy deposits and seep areas that have a surface layer that is high in organic matter content. Also included are a few intermingled areas of Iuka and Mantachie soils on the flood plain and the adjacent Smithdale and Luverne soils on toe slopes. Included soils make up 10 to 15 percent of this map unit.

Bibb soils are mostly used as woodland with scattered areas of cropland or pasture. These soils are not suited to cultivated crops but are fairly suited to pasture and

hay. Frequent flooding and wetness are the main limitations.

The Bibb soils are well suited to loblolly pine and sweetgum. Because of wetness, these soils remain in woodland. The equipment limitations and seedling mortality are severe because of wetness and frequent flooding. The equipment limitation, however, can be overcome to some extent by logging during drier seasons.

These soils are well suited to use as wetland wildlife habitat and fairly suited to use as woodland wildlife habitat.

Flooding and wetness are severe limitations for most urban uses. These limitations are very difficult to overcome.

Bibb soils are in capability subclass Vw and woodland group 2w.

10—Bodine-Allen association, hilly. This map unit consists of deep, well drained and somewhat excessively drained soils on side slopes and narrow ridgetops. Slopes range from 15 to 35 percent. Individual areas range from 140 to 900 acres.

Bodine loam makes up about 50 percent of the map unit. Typically, the surface layer is very dark grayish brown loam about 5 inches thick. The subsurface layer is light yellowish brown cherty loam to a depth of 15 inches. The upper part of the subsoil is yellowish brown cherty loam to a depth of 21 inches. The lower part is yellowish red very cherty clay loam to a depth of 53 inches and very cherty loam to a depth of 62 inches or more.

This Bodine soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid. Permeability is moderately rapid, and available water capacity is low. The root zone is deep; however, because of the excessive amount of chert fragments, the roots have difficulty penetrating in most areas.

Allen fine sandy loam makes up about 40 percent of the map unit. Typically, the surface layer is brown fine sandy loam about 4 inches thick. The subsurface layer, to a depth of 9 inches, is yellowish brown loam. The upper part of the subsoil, to a depth of 15 inches, is yellowish red loam and, to a depth of 46 inches, yellowish red sandy clay loam. The lower part is red sandy clay loam to a depth of 60 inches or more.

This Allen soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid. Permeability and available water capacity are moderate. The root zone is deep and easily penetrated by plant roots.

Included with these soils in mapping are Decatur soils on ridgetops and along smooth side slopes. Also included are small areas of clayey cherty soils. Included soils make up about 10 percent of this unit.

The soils in this unit are mainly used as woodland and for small vegetable gardens. Some areas are used for pasture.

These soils are not suited to cultivated crops. They are poorly suited to pasture and hay. Large stones and steep, abrupt slopes are severe limitations that are difficult to overcome.

The soils in this unit are fairly suited to loblolly pine and shortleaf pine. Most areas are in mixed upland oaks. Steep and abrupt slopes can cause a severe hazard of erosion. Because of slope, the equipment limitation and seedling mortality are severe. These soils are well suited to use as woodland wildlife habitat.

These soils are poorly suited to most urban uses. Steep slopes and stoniness of the Bodine soil are limitations that are difficult to overcome.

The Bodine soil is in capability subclass VIIs and woodland group 3f. The Allen soil is in capability subclass VIe and woodland group 3r.

11—Boswell loam, 4 to 10 percent slopes. This deep, moderately well drained clayey soil is on toe slopes and low knolls of the upper Coastal Plain. Slopes are smooth and concave. They range from 4 to 10 percent. Individual areas range from 10 to 600 acres.

Typically, the surface layer is dark brown loam about 4 inches thick. The upper part of the subsoil is red clay to a depth of 26 inches. The lower part is mottled in shades of red, gray, and brown clay to a depth of 70 inches. The underlying material is mottled gray and dark gray clay.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout, unless the surface layer has been limed. Permeability is very slow, and available water capacity is high. Tilth is good, and the soil can be worked throughout a moderate range in moisture content. The root zone is deep and can be penetrated by plant roots. Root growth is somewhat restricted because of the high clay content during periods of low rainfall.

Included with this soil in mapping are soils on convex areas that have a surface layer of gravelly loam or loamy sand. On a few eroded knolls are soils that have a surface layer of yellowish red to red clay loam or sandy clay loam. Also included are areas of Bama, Smithdale, and Luverne soils. The included soils make up about 15 to 20 percent of this map unit.

Most areas of this Boswell soil are used as woodland, although most areas were formerly used for cultivated crops and pasture. Some areas are still used for pasture.

This soil is poorly suited to cultivated crops and is fairly suited to pasture and hay. Suitability is limited because many areas are small and slopes are complex with many concave and convex areas. The high clay content and slow permeability also restrict the use of farm equipment during periods of high rainfall. Erosion is a severe hazard if cultivated crops are grown. Minimum tillage, terracing, and the use of cover crops in the cropping system slow runoff and help control erosion.

This soil is well suited to loblolly pine. Moderate seedling mortality and equipment limitation are the main

concerns in woodland use and management. The equipment limitation is caused by low strength and wetness and can be overcome by logging during drier seasons.

This Boswell soil is fairly suited to use as woodland wildlife habitat. The absence of a variety of hardwood trees and shrubs is a limitation for this use. The Boswell soil is poorly suited to most urban uses. High shrink-swell potential, low strength, and slow permeability are the main limitations. These limitations are very difficult to overcome.

The Boswell soil is in capability subclass IVe and woodland group 3c.

12—Brilliant very shaly loam, 6 to 45 percent slopes. This deep, somewhat excessively drained, shaly soil is in alkaline spoils resulting from coal strip mining operations. Some areas have been reclaimed, and slopes are smooth and concave. Areas that have not been reclaimed have complex and steep slopes with many large rocks on the surface, vertical high walls, and deep pits that form deep, narrow lakes of 3 to 5 acres. Reclaimed areas have long, smooth slopes that blend in with the natural landscape, large rocks that have been covered, vertical high walls that have been leveled or filled, approaches to large pits of water that have been smoothed, and vegetation that has been established. Individual areas range from 100 to 800 acres.

Typically, the surface layer is grayish brown very shaly loam about 4 inches thick. Fragments are about 85 percent by volume. The underlying material is grayish brown very shaly loam to a depth of more than 70 inches. Content of shale and siltstone fragments is about 80 percent by volume.

This soil is moderate in natural fertility and low in organic matter content. Reaction ranges from medium acid to moderately alkaline throughout. Permeability is moderately rapid, and available water capacity is low. Tilth is poor because of the large volume of fragments and soil crusting. This soil is deep, but root penetration is restricted by the large amount of fragments.

Included with this soil in mapping are small strip mined areas of the more acid Palmerdale soils. Also included are small areas of Montevallo, Nauvoo, and Pikeville soils. The included soils make up less than 10 percent of any mapped area.

Reclaimed areas of this Brilliant soil are mainly used as woodland. Most areas that have not been reclaimed are either mined for deeper seams of coal or remain abandoned.

The soil in this map unit is not suited to cultivated crops. Reclaimed areas are poorly suited to pasture and hay. The excessive amounts of fragments that restrict root growth, low available water capacity, and poor tilth are limitations (fig. 3). Areas that have not been reclaimed are not suited to pasture and hay production. Large rocks on the surface, steep slopes, numerous small fragments that restrict root growth, and low available water capacity are limitations. Onsite investigation is needed to determine whether areas have been reclaimed.

This soil is fairly suited to Virginia pine, yellow-poplar, sweetgum, American sycamore, royal paulownia, and loblolly pine. The hazard of erosion is severe. The equipment limitation is moderate on reclaimed areas and severe on unreclaimed areas. The soil is fairly suited to use as woodland wildlife habitat. It is poorly suited to most urban uses because of steep slopes, large rocks on the surface, and a possible hazard of subsidence.

The Brilliant soil is in capability subclass VIIs and woodland group 3x.

13—Cahaba sandy loam. This deep, well drained soil is on terraces along large streams of the Coastal Plain. Some areas of this soil are subject to rare flooding. Slopes range from 0 to 4 percent. Individual areas range from 10 to 775 acres.

Typically, the surface layer is dark yellowish brown sandy loam about 4 inches thick. The upper part of the subsoil is yellowish red clay loam to a depth of 19 inches. The lower part is yellowish red sandy clay loam to a depth of 37 inches. The underlying material is yellowish red, mottled loamy sand.

This soil is low in natural fertility and organic matter content. Permeability and available water capacity are moderate. Reaction ranges from medium acid to very strongly acid, unless the surface layer has been limed. This soil can be worked throughout a wide range in moisture content. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are soils in the same position on the landscape but that have sandier texture. Small inclusions of Adaton and Dundee soils are in depressional areas. The included soils make up about 15 percent of this map unit.

This Cahaba soil is mainly used for cultivated crops, and most areas are planted to cotton. The soil is well suited to cultivated crops, pasture, and hay. Minimum tillage and the use of cover crops in the cropping system, including grasses and legumes, help to slow runoff and control erosion.

The Cahaba soil is well suited to loblolly pine and yellow-poplar. There are no significant limitations for woodland use and management. This soil is well suited to use as woodland wildlife habitat.

This soil is well suited to most urban uses. There is a hazard of rare flooding in some areas.

The Cahaba soil is in capability class I and woodland group 2o.

14—Choccolocco silt loam. This deep, well drained soil is on high stream terraces above escarpment banks of the Black Warrior River. It is rarely flooded. Slopes are smooth to rilled, and convex slopes are 3 percent or less. Slopes range from 0 to 3 percent. Individual areas range from 10 to 1,300 acres.

Figure 3.—A reclaimed area of Brilliant very shaly loam, 6 to 45 percent slopes, that has been planted to Abruzzi rye.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsoil is brown silty clay loam to a depth of 38 inches and loam to a depth of 44 inches. The underlying material is brown loam.

This soil is medium in natural fertility and organic matter content. Reaction ranges from medium acid to very strongly acid, unless the surface layer has been limed. Permeability and available water capacity are moderate. Tilth is good, and the soil can be worked throughout a wide range in moisture content. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are convex areas that have a sandy surface layer and some soils that have a yellowish brown subsoil. Also included are a few depressions and low areas of Adaton, Falkner, and Dundee soils. The included soils make up about 15 percent of the map unit.

Most of the acreage of this Choccolocco soil is used for cultivated crops and planted mainly to cotton, soybeans, and corn (fig. 4). Some areas of this soil are used for pasture and planted mainly to fescue and clover.

This soil is well suited to cultivated crops, pasture, and hay. The hazard of erosion is slight if cultivated crops are grown. Minimum tillage and the use of cover crops in the cropping system, including grasses and legumes, help to slow runoff and control erosion.

The Choccolocco soil is well suited to loblolly pine, yellow-poplar, sweetgum, and water oak. It is also well suited to woodland wildlife habitat.

This soil is fairly suited to most urban uses. Rare flooding is a limitation that can be overcome by building up the area or by constructing a levee.

The Choccolocco soil is in capability class I and woodland group 3o.

Figure 4.—Sorghum growing on Choccolocco silt loam.

15—Decatur loam, 2 to 8 percent slopes. This deep, well drained soil is on ridgetops and plateaus of the limestone and chert area of the county. Slopes are smooth and concave. They range from 2 to 8 percent. Individual areas range from 10 to 650 acres.

Typically, the surface layer is dark reddish brown loam about 4 inches thick. The subsoil is dark red silty clay loam to a depth of more than 72 inches.

The soil is low in natural fertility and organic matter content. Reaction ranges from medium acid to very strongly acid throughout, unless the surface layer has been limed. Permeability is moderate, and available water capacity is high. Runoff is medium. Tilth is good. The soil can be worked throughout a wide range in moisture content. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are concave areas that have a lighter colored subsoil. Also included are areas that have a cherty surface layer. A few small areas of Allen and Bodine soils are also included. The included soils make up about 10 percent of the map unit.

Most of the acreage of this Decatur soil is in pasture, although some areas are used for cultivated crops and vegetable gardens. The pasture is mainly planted to fescue.

This soil is well suited to cultivated crops, pasture, and hay. Tilth is easily maintained by returning crop residue to the soil. The hazard of erosion is moderate if cultivated crops are grown. Minimum tillage, terraces, and the use of cover crops in the cropping system, including grasses and legumes, help to slow runoff and control erosion.

The Decatur soil is well suited to loblolly pine and yellow-poplar. There are no significant limitations for woodland use and management. The soil is well suited to use as woodland wildlife habitat.

This soil is fairly suited to most urban uses. The moderate shrink-swell potential and low strength are limitations that can be overcome by proper engineering design and installation of structures. Areas of this soil are subject to sinkhole development, and care should be taken in the selection of construction sites.

The Decatur soil is in capability subclass IIe and woodland group 3o.

16—Dundee silt loam. This deep, somewhat poorly drained soil is on low terraces of the major streams in the county. It is more extensive along the Black Warrior River and is subject to rare flooding. Slopes are generally smooth with concave areas throughout. Slopes range from 0 to 2 percent. Individual areas range from 10 to 1,800 acres.

Typically, the surface layer is brown silt loam about 3 inches thick. The subsurface layer is dark grayish brown silt loam to a depth of 13 inches. The upper part of the subsoil is pale brown, mottled silt loam to a depth of 36 inches. The lower part is gray, mottled silty clay loam to a depth of 58 inches. The underlying material is gray, mottled silty clay loam.

This soil is low in natural fertility and organic matter content. Reaction ranges from medium acid to very strongly acid throughout, unless the surface layer has been limed. Permeability is moderately slow, and available water capacity is high. Tilth is fair, and the soil can only be worked through a narrow range in moisture content. The root zone is deep, but plant roots are somewhat restricted by a high water table during periods of heavy rainfall.

Included with this soil in mapping are the Adaton and Falkner soils. The included soils make up about 10 percent of this unit.

Most of the acreage of this Dundee soil is used for cultivated crops and pasture. Most cultivated areas are planted to soybeans (fig. 5).

Figure 5.—Soybeans growing on Dundee silt loam.

This soil is well suited to cultivated crops, pasture, and hay if it is drained. Undrained areas that have numerous depressions and areas adjacent to wetter areas that have slow runoff and slow internal drainage are fairly suited to these uses. Slow internal drainage delays spring planting and harvesting of the crop. Good tilth can be maintained and improved by returning crop residue to the soil.

Yellow-poplar, sweetgum, and cherrybark oak are well suited to this soil. The equipment limitation and plant competition are moderate.

This soil is well suited to use as woodland wildlife habitat. There are no significant limitations for woodland use and management.

The Dundee soil is poorly suited to most urban uses. Wetness, rare flooding, and low strength are severe limitations that are very difficult to overcome.

This soil is in capability subclass IIw and woodland group 2w.

17—Ellisville silt loam, frequently flooded. This deep, well drained, frequently flooded soil is on flood plains and low stream terraces. Slopes range from 0 to 2 percent. Individual areas range from 20 to 3,000 acres.

Typically, the surface layer is very dark grayish brown silt loam about 3 inches thick. The subsurface layer is dark grayish brown silt loam to a depth of 9 inches and dark brown silty clay loam to a depth of 15 inches. The upper part of the subsoil is dark brown silty clay loam to a depth of 25 inches. The lower part is brown, mottled silty clay loam to a depth of 58 inches. The underlying material is brown silt loam.

This soil is high in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout, unless the surface layer has been limed. Permeability is moderate, and available water capacity is high. Tilth is good, and the soil can be worked throughout a wide range in moisture content. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are Adaton, Cahaba, and Choccolocco soils. The included soils make up about 15 percent of this map unit.

This Ellisville soil is mainly used for cultivated crops, such as cotton and soybeans. Some areas are used for pasture, and a small acreage remains in woodland. The pasture is usually planted to fescue and clover.

This soil is well suited to cultivated crops and pasture. Flooding during spring months, however, can cause crop failures for some long-season crops, such as cotton and corn. When the soil is used for pasture, the frequency of flooding and depth of the water may be a hazard to livestock during periods of heavy rainfall.

This Ellisville soil is well suited to use as woodland. Yellow-poplar, water oak, and loblolly pine are the most productive trees. The soil is fairly suited to use as woodland wildlife habitat. Frequent flooding is a severe limitation for most urban uses.

The Ellisville soil is in capability subclass IIw and woodland group 1o.

18—Falkner silt loam. This deep, moderately well drained soil is on terraces of large streams. Slopes range from 0 to 2 percent. Individual areas range from 10 to 100 acres.

Typically, the surface layer is dark brown silt loam about 3 inches thick. The subsurface layer is yellowish brown, mottled silt loam to a depth of 12 inches. The upper part of the subsoil is yellowish brown, mottled silty clay loam to a depth of 39 inches. The lower part is mottled yellowish brown, dark yellowish brown, pale brown, and light brownish gray silt loam to a depth of 63 inches. The underlying material is yellowish brown, mottled silt loam.

This soil is low in natural fertility and organic matter content. Reaction ranges from medium acid to very strongly acid throughout, unless the surface has been limed. Permeability is slow, and available water capacity is high. Tilth is fair, and the soil can only be worked through a narrow range in moisture content. The water table is seasonally high and is at a depth of 24 inches late in winter and early in spring. The root zone is deep, but plant roots are somewhat restricted by the high water table during periods of heavy rainfall.

Included with this soil in mapping are a few small areas of Adaton and Dundee soils in depressional areas and narrow depressional strips along small streams. The included soils make up about 15 percent of this unit.

Most of this Falkner soil is used for cultivated crops and pasture. Most cultivated areas are planted to soybeans. The pasture is usually planted to fescue or coastal bermudagrass.

This soil is well suited to cultivated crops, pasture, and hay. Suitability is limited in some areas because of the numerous depressions and adjacent wetter soils. Good tilth is difficult to maintain in areas that have a silty surface layer that causes clodding. This limitation can be overcome by returning crop residue to the soil.

The Falkner soil is well suited to loblolly pine, cherrybark oak, yellow-poplar, and sweetgum. The equipment limitation and plant competition are moderate. The soil is well suited to use as woodland wildlife habitat.

This soil is poorly suited to most urban uses. Low strength and wetness are limitations that cannot be easily overcome.

The Falkner soil is in capability subclass IIw and woodland group 2w.

19—Iuka-Mantachie complex, frequently flooded. This map unit consists of deep, moderately well drained and somewhat poorly drained, frequently flooded soils along upland streams throughout the county. Mantachie

and luka soils are in an irregular pattern on the landscape and are so intermingled that it was not practical to map them separately. Slopes range from 0 to 2 percent. Individual areas range from 30 to 1,000 acres.

About 45 percent of the map unit is luka silt loam. Typically, the surface layer is dark yellowish brown silt loam about 4 inches thick. The subsurface layer is yellowish brown loamy sand to a depth of 10 inches. The upper part of the underlying material is dark yellowish brown silt loam to a depth of 13 inches and pale brown loam to a depth of 18 inches. The lower part is mottled grayish brown, light brownish gray, light olive brown, and dark yellowish brown loamy sand with strata of sandy loam.

This luka soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout, unless the surface layer has been limed. Permeability and available water capacity are moderate. The water table is seasonally high and at a depth of 20 to 30 inches during winter and early in spring. The root zone is deep, but plant roots are somewhat restricted by the high water table during periods of heavy rainfall.

About 30 percent of the map unit is Mantachie loam. Typically, the surface layer is brown loam about 6 inches thick. The upper part of the subsoil is yellowish brown, mottled silt loam to a depth of 18 inches. The middle part is mottled grayish brown, light brownish gray, and light yellowish brown loam to a depth of 26 inches and is light brownish gray, mottled loam to a depth of 45 inches. The lower part is gray, mottled sandy clay loam to a depth of 55 inches. The underlying material is light brownish gray, mottled loamy sand.

This Mantachie soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout, unless the surface layer has been limed. Permeability is moderate, and available water capacity is high. The water table is seasonally high and is at a depth of 18 inches during winter and early in spring. The root zone is deep, but plant roots are somewhat restricted by the high water table during periods of heavy rainfall.

Included with these soils in mapping are small areas of Bibb, Luverne, Shatta, and Smithdale soils. These included soils make up about 25 percent of the unit.

Most of the acreage in this map unit is used as woodland; however, some areas are used for cultivated crops and pasture. Undrained areas of this soil are poorly suited to cultivated crops but are fairly suited to pasture and hay. These soils have a seasonal high water table, are frequently flooded, and have slow internal drainage. All or any of these factors restricts the use of farm equipment during periods of heavy rainfall.

These soils are well suited to loblolly pine, eastern cottonwood, sweetgum, and cherrybark oak. The equipment limitation and seedling mortality are severe because of wetness and frequent flooding. The equipment limitation can be overcome to some extent by logging during drier seasons.

The soils in this unit are fairly suited to use as wetland wildlife habitat. They are well suited to use as woodland wildlife habitat.

Wetness and flooding are severe limitations for most urban uses. These limitations are very difficult to overcome.

The luka and Mantachie soils are in capability subclass Vw and woodland group 1w.

20—Luverne-Smithdale complex, 4 to 10 percent slopes. This map unit consists of deep, well drained soils that are on low lying hills and knolls in the southern part of the county. Areas of Luverne and Smithdale soils are so intermingled that it was not practical to map them separately. Slopes range from 4 to 10 percent. Individual areas range from 10 to 1,500 acres.

Luverne fine sandy loam makes up about 60 percent of each mapped area. Typically, the surface layer is dark yellowish brown fine sandy loam about 4 inches thick. The subsoil is dark red clay and sandy clay to a depth of 39 inches. The underlying material is yellowish red, stratified loamy sand and clay.

Luverne soil is low in natural fertility and organic matter content. Reaction ranges from strongly acid to extremely acid throughout, unless the surface layer has been limed. Permeability is moderately slow, and available water capacity is moderate. The root zone is deep and easily penetrated by plant roots.

Smithdale fine sandy loam makes up about 30 percent of each mapped area. Typically, the surface layer is dark brown fine sandy loam about 5 inches thick. The upper part of the subsoil is red loam to a depth of 42 inches. The lower part is yellowish red sandy loam to a depth of 52 inches and sandy clay loam to a depth of 72 inches or more.

The Smithdale soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout, unless the surface has been limed. Permeability and available water capacity are moderate. The root zone is deep and easily penetrated by plant roots.

Included with the soils in this unit in mapping are areas of soils on knolls and along side slopes that have a sandy subsoil and areas of soils that contain as much as 15 percent gravel. Also included are areas of Boswell and Bama soils. Included soils make up about 10 percent of this unit.

Most of the acreage in this unit is used for pasture or as woodland. The pasture is mainly planted to bahiagrass.

The soils in this unit are fairly suited to poorly suited to cultivated crops. These soils are well suited to pasture and hay. The complex slopes and the shallow, easily erosive surface layer are limitations for cultivated crops.

Erosion is a hazard if cultivated crops are grown; but terraces, minimum tillage, and the use of cover crops in the cropping system, including grasses and legumes, help to slow runoff and control erosion.

These soils are well suited to loblolly pine and longleaf pine. The equipment limitation and plant competition are moderate. The soils are well suited to use as woodland wildlife habitat.

These soils are fairly suited to most urban uses. The moderate shrink-swell potential, low strength, and high clay content of the Luverne soil are limitations. Low strength and shrink-swell can be overcome by proper design and installation. The clayey subsoil of the Luverne soil has moderately slow permeability and is a severe limitation for septic tank absorption fields. This limitation can be overcome by increasing the size of the absorption area or by modifying the filter field.

Luverne and Smithdale soils are in capability subclass IVe. The Luverne soil is in woodland group 3c, and the Smithdale soil is in woodland group 3o.

21—Montevallo-Nauvoo complex, 15 to 45 percent slopes. This map unit consists of small areas of Montevallo and Nauvoo soils that are so intermingled that it was not practical to map them separately. These shallow and deep, well drained soils are in steep areas of abrupt slopes. Slopes range from 15 to 45 percent. Individual areas range from 10 to 200 acres.

Montevallo shaly loam makes up about 45 percent of each mapped area. Typically, the surface layer is dark grayish brown shaly loam about 2 inches thick. The subsurface layer is light yellowish brown shaly silt loam to a depth of 7 inches. The subsoil is light yellowish brown very shaly silt loam to a depth of 12 inches. The underlying material is yellowish brown, rippable shale bedrock.

This Montevallo soil is low in natural fertility and organic matter content. Reaction ranges from medium acid to very strongly acid throughout. Permeability is moderate, and available water capacity is very low. The root zone is shallow, and the large volume of shale fragments restrict plant roots.

Nauvoo fine sandy loam makes up about 40 percent of each mapped area. 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 17 inches. The subsoil is yellowish red sandy clay loam and clay loam to a depth of about 41 inches. The underlying material is soft sandstone and shale mottled in shades of red, yellow, and gray.

The Nauvoo soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability and available water capacity are moderate. The root zone is deep in most areas and is easily penetrated by plant roots.

Included with the soils in this unit are small areas of Bibb and Iuka soils in narrow drainageways. On steep areas along major creeks are shallow soils underlain by hard sandstone. Also included are soils that have a yellowish brown subsoil and some soils that contain more clay. Smithdale, Pikeville, Ruston, and Allen soils are also included. The included soils make up about 15 percent of this unit.

Most of the acreage in this map unit is used as woodland, but some small areas are used for pasture and vegetable gardens.

The soils in this unit are poorly suited to cultivated crops, pasture, and hay. Shallow areas over rock, large stones, and steep slopes are severe limitations that are difficult to overcome.

These soils are fairly suited to most locally grown trees. Most of the acreage on ridgetops and upper side slopes is used for Virginia pine. A few mixed hardwoods are in narrow drainageways and on toe slopes. Slopes are steep enough to cause a severe hazard of erosion. The use of logging equipment is restricted because of steep abrupt slopes and some large stones or rock outcrops. These soils are fairly suited to use as woodland wildlife habitat. They are poorly suited to most urban uses because of steep slopes, depth to rock, and small stones.

Both soils are in capability subclass VIIe. The Montevallo soil is in woodland group 4d, and the Nauvoo soil is in woodland group 2o.

22—Montevallo-Nauvoo association, steep. This association consists of well drained soils that are in a regular pattern on the landscape. The landscape is mainly a series of steep, wooded hillsides; very narrow winding ridgetops; and narrow drainageways. The Montevallo soil is mainly on the upper and mid slopes, and the Nauvoo soil is on ridgetops and toe slopes. Slopes range from 10 to 45 percent. Mapped areas range from 200 to 8,000 acres.

Montevallo shaly loam makes up about 55 percent of the unit. Typically, the surface layer is dark grayish brown shaly loam about 2 inches thick. The subsurface layer is light yellowish brown shaly silt loam to a depth of 7 inches. The subsoil is light yellowish brown very shaly silt loam to a depth of about 12 inches. The underlying material is yellowish brown rippable shale bedrock.

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

Nauvoo fine sandy loam makes up about 30 percent of the unit. Typically, the surface layer is brown fine sandy loam about 6 inches thick. The subsurface layer is yellowish brown sandy loam to a depth of 17 inches. The subsoil is yellowish red sandy clay loam and clay loam to a depth of 41 inches. The underlying material is soft sandstone and shale mottled in shades of red, yellow, and gray.

The Nauvoo soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly

acid. Permeability and available water capacity are moderate. The root zone is deep in most areas and easily penetrated by plant roots.

Included with these soils in mapping are a few areas of poorly drained soils in narrow drainageways. Also included are a few areas of soils that are underlain by hard sandstone at a shallow depth and a few areas that have a clayey subsoil. Smithdale, Flomaton, and Pikeville soils are also included. Included soils make up about 15 percent of the unit.

Most of the acreage in this unit is used as woodland. Some small ridgetop areas are used for pasture or vegetable gardens.

The soils are poorly suited to cultivated crops, pasture, and hay. Slope, depth to rock, and the hazard of erosion are severe limitations. The soils are poorly suited to pasture and hay because slope and rock fragments on the surface are limitations for the use of equipment in most areas.

These soils are fairly suited to loblolly pine and Virginia pine. The moderate to severe equipment limitation and hazard of erosion are the main management concerns. This map unit is well suited to use as woodland wildlife habitat.

The soils in this map unit are poorly suited to most urban uses. Depth to rock and steep slopes are severe limitations for most urban uses. These limitations are very difficult to overcome.

Both soils are in capability subclass VIIe. The Montevallo soil is in woodland group 4d, and the Nauvoo soil is in woodland group 2o.

23—Nauvoo fine sandy loam, 4 to 10 percent slopes. This deep, well drained soil is on upland ridgetops and plateaus. Slopes range from 4 to 10 percent. Individual areas range from 15 to 2,300 acres.

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 17 inches. The subsoil is yellowish red sandy clay loam and clay loam to a depth of 41 inches. The underlying material is soft sandstone and shale mottled in shades of red, yellow, and gray.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid, unless the surface layer has been limed. Permeability and available water capacity are moderate. Tilth is good, and the soil can be worked throughout a wide range in moisture content. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of soils that are similar but that have a clayey subsoil. Also included are small areas of Bama, Montevallo, Pikeville, and Smithdale soils. Included soils make up about 15 percent of this unit.

Most of this Nauvoo soil is used as woodland. Some areas are used for pasture or cultivated crops.

This soil is fairly suited to cultivated crops and well suited to pasture and hay. Complex slopes are a moderate limitation for cultivation with multirow equipment. Erosion is a hazard if the soil is cultivated. Terraces, minimum tillage, and cover crops, including grass and legumes, in the cropping system help to reduce runoff and control erosion.

Loblolly pine and Virginia pine are well suited to this Nauvoo soil. There are no significant limitations for woodland use or management. This soil is well suited to use as woodland wildlife habitat.

This soil is fairly suited to most urban uses because of depth to rock. Depth to rock is a moderate limitation for septic tank absorption fields, sewage lagoons, and sanitary landfills. This limitation is difficult to overcome for most uses.

The Nauvoo soil is in capability subclass IIIe and woodland group 2o.

24—Palmerdale very gravelly loam, 6 to 45 percent slopes. This map unit consists of a deep, somewhat excessively drained gravelly soil. This soil is the spoil remaining from strip mining operations for coal in areas where coal is overlain by deep beds of sand and gravel. The surface layer varies in texture and color depending upon the coal seam removed and whether the spoils have been smoothed. Slopes on older areas that have not been reclaimed or remined are very steep and complex with many high walls and deep pits that contain water. The smoothed or reclaimed areas ordinarily have long smooth slopes with high walls, steep back slopes, and approaches to deep pits of water; but they are smoothed and blended in with the landscape. Slopes range from 6 to 45 percent. Individual areas range from 200 to 2,000 acres.

Typically, the surface layer is brown very gravelly loam 6 inches thick and is about 70 percent gravel. The upper part of the underlying material is brown gravelly silty clay loam to a depth of 23 inches and is about 50 percent gravel. The lower part is stratified, grayish brown to yellowish red silty clay loam and sandy loam and is about 40 percent shale fragments and 5 percent gravel.

Palmerdale soil is very low in natural fertility and organic matter content. Reaction ranges from strongly acid to extremely acid throughout. Permeability is moderately rapid. Available water capacity is low. Tilth is fair. Crusting of the surface layer is a concern if the surface layer is clayey. The root zone is deep but is somewhat restricted by the large amounts of gravel.

Included with this soil in mapping are a few clayey areas in which gravel content is less than 15 percent and the pH level is below 3.8. Also included are small areas of shaly Flomaton, Pikeville, and Palmerdale soils in narrow strips. Included soils make up about 15 percent of this map unit.

Most unreclaimed areas of this Palmerdale soil are dominantly void of vegetation except for a few scattered pine and hardwood trees. Reclaimed areas are planted to grasses and legumes, and some areas are planted to pines.

This soil is not suited to cultivated crops, pasture, and hay. Excessive amounts of rock fragments, low available water capacity, and high soil acidity are limitations (fig. 6). Very steep, complex slopes and numerous large rocks on the surface are limitations for any type of crops in unreclaimed areas. The hazard of erosion is very severe if this soil is cultivated. Onsite investigation is needed to determine whether or not the areas have been reclaimed.

The Palmerdale soil is fairly suited to loblolly pine. The hazard of erosion is severe. The equipment limitation is moderate to severe in reclaimed areas and is severe in unreclaimed areas. This soil is fairly suited to use as woodland wildlife habitat. It is not suited to most urban uses because of steep slopes and low strength.

The Palmerdale soil is in capability subclass VIIs and woodland group 3x.

25—Palmerdale very shaly loam, 6 to 45 percent slopes. This map unit consists of a deep, somewhat excessively drained acid soil. This soil is the spoil remaining from strip mining operations in areas where coal is overlain by soft sandstone and shale. The surface layer varies in texture depending upon the coal seam removed and whether spoils have been smoothed. The older areas that have not been reclaimed or remined have very steep and complex slopes and have many high walls and deep pits that contain water (fig. 7). The smoothed or reclaimed areas ordinarily have long smooth slopes with high walls, steep back slopes, and approaches to deep pits of water; but they are smoothed and blended in with the natural landscape. Slopes range from 6 to 45 percent. Individual areas range from 60 to 3,700 acres.

Figure 6.—Pumpkins and watermelons, which are drought-tolerant, are being grown experimentally on Palmerdale very gravelly loam, 6 to 45 percent slopes. This area has been reclaimed.

Figure 7.—This area of Palmerdale very shaly loam, 6 to 45 percent slopes, has not been reclaimed.

Typically, the surface layer is grayish brown very shaly loam that is as much as 60 percent shale and sandstone fragments and is about 5 inches thick. The underlying material is grayish brown very shaly sandy loam that is approximately 90 percent fragments.

Palmerdale soil is very low in natural fertility and organic matter content. Reaction ranges from strongly acid to extremely acid throughout. Permeability is moderately rapid, and available water capacity is low. Tilth is poor, but the soil can be worked throughout a wide range in moisture content. The root zone is restricted by large rocks.

Included with this soil in mapping are a few areas of Palmerdale very gravelly loam and areas where large rock fragments cover more than 90 percent of the surface. Also included are Brilliant, Montevallo, Nauvoo, Pikeville, and Smithdale soils. Included soils make up about 15 percent of the area.

Most unreclaimed areas of this Palmerdale soil are dominantly void of vegetation with a few scattered pine and hardwood trees. Reclaimed areas have been planted to grasses and legumes or pines.

This soil is not suited to cultivated crops. The reclaimed areas are fairly suited to pasture and hay. The restricted root zone, low available water capacity, and poor tilth are limitations. Unreclaimed areas are poorly suited to hay and pasture crops. Steep slopes, a restricted root zone, large rocks on the surface, low

available water capacity, and poor tilth are limitations. The hazard of erosion is severe if these soils are tilled. Onsite investigation is needed to determine whether or not areas have been reclaimed.

The Palmerdale soil is fairly suited to loblolly pine. The hazard of erosion is severe. The equipment limitation is moderate in most reclaimed areas and severe in unreclaimed areas. The soil is fairly suited to use as woodland wildlife habitat. It is poorly suited to most urban uses because of steep slopes, large rocks on the surface, and low strength.

The Palmerdale soil is in capability subclass VIIs and woodland group 3x.

26—Pits. This map unit consists of areas from which the original soil has been removed. Individual areas range from 3 to 112 acres.

On uplands, the soil in this unit has been a source of base material for highways, building foundations, or fill material. Areas of this unit on uplands were originally Bama, Smithdale, Pikeville, Luverne, or Flomaton soils. The soil has been removed to a depth of 5 to 40 feet. Normally, the sides of these Pits are vertical.

On stream terraces, sand and gravel have been removed. Areas of this unit on stream terraces were originally Cahaba and Choccolocco soils. The soil has been removed to a depth of 5 to 15 feet. Normally, the sides of these Pits are moderately sloping to strongly sloping.

Most of these areas have been abandoned. The exposed subsoil and parent material have low fertility. These areas are not suited to cultivated crops, pasture, hay, wildlife habitat, or urban uses. The areas are fairly suited to use as woodland.

This map unit is not in a capability subclass or woodland group.

27—Ruston fine sandy loam, 0 to 2 percent slopes. This deep, well drained soil is on ridgetops and plateaus on the Coastal Plain uplands. Slopes range from 0 to 2 percent. Individual areas range from 10 to 100 acres.

Typically, the surface layer is dark brown fine sandy loam about 3 inches thick. The subsurface layer is yellowish brown fine sandy loam to a depth of 8 inches. The upper part of the subsoil is yellowish red loam to a depth of 26 inches. The middle part is yellowish red, mottled loam with pockets of pale brown fine sandy loam to a depth of 33 inches. The lower part is yellowish red sandy clay loam to a depth of 61 inches and mottled yellowish red, red, and reddish yellow loam to a depth of 81 inches or more.

This soil is low in natural fertility and organic matter content. Reaction ranges from medium acid to very strongly acid, unless the surface layer has been limed. Permeability and available water capacity are moderate. Tilth is good, and the soil can be worked throughout a wide range in moisture content. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are small areas of Bama and Shatta soils. The included soils make up about 10 percent of each mapped area.

Most areas of this Ruston soil are used for cultivated crops or pasture. This soil is well suited to cultivated crops, pasture, and hay. Good tilth can be easily maintained by returning crop residue to the soil. The hazard of erosion is slight if cultivated crops are grown. Minimum tillage and the use of cover crops in the cropping system, including grasses and legumes, help to reduce runoff and control erosion.

This soil is well suited to loblolly pine and longleaf pine. There are no significant limitations for woodland use and management. This soil is also well suited to use as woodland wildlife habitat.

The Ruston soil is well suited to most urban uses. Seepage is a moderate limitation for sewage lagoons. Slow movement of effluent is a moderate limitation for septic tank absorption fields, and low strength is a moderate limitation for local roads and streets. These limitations can be overcome by proper design and installation.

The Ruston soil is in capability class I and woodland group 3o.

28—Ruston fine sandy loam, 2 to 6 percent slopes. This deep, well drained soil is on broad ridgetops and plateaus of the Coastal Plain uplands. Slopes are smooth and concave. They range from 2 to 6 percent. Individual areas range from 10 to 100 acres.

Typically, the surface layer is dark brown fine sandy loam about 3 inches thick. The subsurface layer is yellowish brown fine sandy loam to a depth of 8 inches. The upper part of the subsoil is yellowish red loam to a depth of 26 inches. The middle part is yellowish red, mottled loam with pockets of pale brown fine sandy loam to a depth of 33 inches. The lower part is yellowish red sandy clay loam to a depth of 61 inches and mottled yellowish red, red, and reddish yellow loam to a depth of 81 inches or more.

This soil is low in natural fertility and organic matter content. Reaction ranges from medium acid to very strongly acid, unless the surface layer has been limed. Permeability and available water capacity are moderate. Tilth is good, and the soil can be worked throughout a wide range in moisture content. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are small areas of Bama, Luverne, and Shatta soils. The included soils make up about 15 percent of the unit.

Most of this Ruston soil is used for cultivated crops or pasture. Cultivated areas are planted to cotton and soybeans. Bahiagrass is the main pasture grass.

This soil is well suited to cultivated crops, pasture, and hay (fig. 8). Limitations for these uses are the small size and irregular shape of the areas and the slope of the adjacent soils. Good tilth can be easily maintained by returning crop residue to the soil. The hazard of erosion

is moderate if cultivated crops are grown. Terraces, minimum tillage, and the use of cover crops in the cropping system, including grasses and legumes, help to reduce runoff and control erosion.

The Ruston soil is well suited to loblolly pine and longleaf pine. There are no significant limitations for woodland use and management. This soil is well suited to use as woodland wildlife habitat.

The soil is well suited to most urban uses. Slow movement of effluent and slow percolation are moderate limitations for septic tank absorption fields, and seepage is a moderate limitation for sewage lagoons. Low strength is a moderate limitation for local roads and streets. These limitations can be overcome by proper design and installation.

The Ruston soil is in capability subclass IIe and woodland group 3o.

29—Shatta silt loam, 0 to 2 percent slopes. This deep, moderately well drained soil is on the higher terraces of the major streams in the county, mainly along the Black Warrior River. Slopes are smooth and concave. They range from 0 to 2 percent. Individual areas range from 10 to 600 acres.

Typically, the surface layer is dark grayish brown silt loam about 7 inches thick. The subsurface layer is yellowish brown silt loam to a depth of 13 inches. The upper part of the subsoil is yellowish brown silt loam to a

Figure 8.—Mature cotton on Ruston fine sandy loam, 2 to 6 percent slopes.

depth of 21 inches. The lower part is brittle, yellowish brown, mottled silt loam and clay loam to a depth of 45 inches and strong brown, mottled clay loam to a depth of 60 inches or more.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout, unless the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. Available water capacity is moderate. Tilth is good, and the soil can be worked throughout a wide range in moisture content. The root zone is restricted by the compact and brittle subsoil.

Included with this soil in mapping are soils on convex areas that have a sandy loam and loamy sand surface. Also included are a few areas of Adaton, Bama, and Cahaba soils. The included soils make up about 10 percent of this map unit.

Most of the acreage of this Shatta soil is used for cultivated crops and pasture. Cultivated areas are planted mainly to soybeans. Fescue and coastal bermudagrass are two main pasture grasses.

This soil is well suited to cultivated crops, pasture, and hay. The slow internal drainage is a limitation for use of farm equipment during periods of heavy rainfall. Good tilth is easily maintained by returning crop residue to soil.

This Shatta soil is well suited to loblolly pine, sweetgum, and yellow-poplar. There are no significant limitations for woodland use or management. This soil is well suited to use as woodland wildlife habitat.

This soil is fairly suited to most urban uses. Permeability and wetness are the main limitations. The lower part of the subsoil has moderately slow permeability, which is a severe limitation for septic tank absorption fields. This limitation can be partly overcome by proper engineering design.

The Shatta soil is in capability subclass IIw and woodland group 3o.

30—Shatta silt loam, 2 to 6 percent slopes. This deep, moderately well drained soil is on the more sloping areas along higher terraces of the major streams in the county, and some areas are on upland plateaus. Slopes are smooth and concave. They range from 2 to 6 percent. Individual areas range from 10 to 900 acres.

Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The subsurface layer is yellowish brown silt loam to a depth of 13 inches. The upper part of the subsoil is yellowish brown silt loam to a depth of 21 inches. The lower part is brittle, yellowish brown, mottled silt loam and clay loam to a depth of 45 inches and strong brown, mottled clay loam to a depth of 60 inches or more.

This soil is low in natural fertility and organic matter content. Reaction is very strongly acid throughout, unless the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. Available water capacity is moderate. The root zone is restricted by the compact and brittle subsoil.

Included with this soil in mapping are soils on convex areas that have a sandy loam and loamy sand surface. Also included are a few areas of Bama and Cahaba soils. The included soils make up about 5 to 10 percent of the map unit.

Most of the acreage of this Shatta soil is used for cultivated crops and pasture. Cultivated areas are planted mainly to soybeans. Fescue and coastal bermudagrass are the main pasture grasses.

This soil is well suited to cultivated crops, pasture, and hay (fig. 9). Good tilth is easily maintained by returning crop residue to the soil. The hazard of erosion is a moderate limitation if cultivated crops are grown. Terraces, minimum tillage, and the use of cover crops in the cropping system, including grasses and legumes, help to slow runoff and control erosion.

The Shatta soil is well suited to loblolly pine, sweetgum, and yellow-poplar. There are no significant limitations for woodland use or management. This soil is well suited to use as woodland wildlife habitat.

This soil is fairly suited to most urban uses. Permeability and wetness are the main limitations. The lower part of the subsoil has moderately slow permeability, which is a severe limitation for septic tank absorption fields. This limitation can be partly overcome by proper engineering design.

The Shatta soil is in capability subclass IIe and woodland group 3o.

31—Shatta-Urban land complex, 0 to 2 percent slopes. This map unit consists of the Shatta soil and Urban land in small areas that are so intermingled that it was not practical to map them separately. The deep, moderately well drained Shatta soil and Urban land are on nearly level, broad ridgetops and plateaus of the Coastal Plain uplands. Slopes range from 0 to 2 percent. They are smooth and concave. Individual areas range from 5 to 100 acres.

Shatta silt loam makes up about 50 percent of each mapped area. Typically, the surface layer is dark grayish brown silt loam about 7 inches thick. The subsurface layer is yellowish brown silt loam to a depth of 13 inches. The upper part of the subsoil is yellowish brown silt loam to a depth of 21 inches. The lower part is brittle, yellowish brown, mottled silt loam and clay loam to a depth of 45 inches and strong brown, mottled clay loam to a depth of 60 inches or more. In many areas the soil has been significantly disturbed or modified by cutting, filling, or grading.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout, unless the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. Available water capacity is moderate. The root zone is restricted by the compact and brittle subsoil.

Figure 9.—Bales of hay on Shatta silt loam, 2 to 6 percent slopes.

Urban land makes up about 45 percent of each mapped area. It consists of areas that are covered by sidewalks, patios, driveways, parking lots, and streets and buildings, such as schools, churches, offices, and industrial plants.

Included with this complex in mapping are a few small areas of Adaton, Bama, and Cahaba soils. Included soils make up about 5 percent of this unit.

The Shatta soil is well suited to most recreation uses and has no significant limitations.

This soil is fairly suited to most engineering uses. The risk of corrosion of uncoated steel and concrete ranges from moderate to high.

This soil is fairly suited to most urban uses. Wetness and a perched water table during wet periods are severe limitations for septic tank absorption fields and moderate limitations for dwellings and small commercial buildings. Low strength is a moderate limitation for local roads and streets if the soil is used as roadfill. Most of these limitations can be partly overcome by proper engineering design and installation.

The Shatta soil is well suited to vegetable gardens and to most plants used in landscaping.

This complex is not in a capability subclass or woodland group.

32—Shatta-Urban land complex, 2 to 6 percent slopes. This map unit consists of Shatta soil and Urban land in small areas that are so intermingled that it was not practical to map them separately. The deep, moderately well drained Shatta soil and Urban land are on gently sloping, broad ridgetops and side slopes of Coastal Plain uplands. Slopes are smooth and convex. They range from 2 to 6 percent. Individual areas range from 40 to 350 acres.

Shatta loam makes up about 50 percent of each mapped area. Typically, the surface layer is dark grayish brown loam about 4 inches thick. The subsurface layer is yellowish brown silt loam to a depth of 13 inches. The upper part of the subsoil is yellowish brown silt loam to a depth of 21 inches. The lower part is brittle, yellowish brown, mottled silt loam and clay loam to a depth of 45 inches and strong brown, mottled clay loam to a depth of 60 inches or more. In many areas the soil has been significantly disturbed or modified by cutting, filling, or grading.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid

throughout, unless the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. Available water capacity is moderate. The root zone is restricted by the compact and brittle subsoil.

Urban land makes up about 45 percent of each mapped area. It consists of areas that are covered by sidewalks, patios, driveways, and parking lots and buildings, such as schools, churches, homes, offices, and industrial sites.

Included with this complex in mapping are a few small areas of Bama and Cahaba soils. Included soils make up about 5 percent of this unit.

The Shatta soil is well suited to most recreation uses. Slope is a moderate limitation for playgrounds.

This soil is fairly suited to most engineering uses. The risk of corrosion of uncoated steel and concrete ranges from moderate to high.

The Shatta soil is fairly suited to most urban uses. Wetness and a perched water table during wet periods are severe limitations for septic tank absorption fields and moderate limitations for dwellings and small commercial buildings. Low strength is a moderate limitation for local roads and streets if the soil is used as roadfill. Most of these limitations can be partly overcome by proper engineering design and installation.

This soil is well suited to vegetable gardens and to most plants used in landscaping.

This complex is not in a capability subclass or woodland group.

33—Smithdale fine sandy loam, 6 to 15 percent slopes. This deep, well drained soil is on ridgetops and side slopes of the Coastal Plain uplands. Slopes range from 6 to 15 percent. Individual areas range from 10 to 1,300 acres.

Typically, the surface layer is dark brown fine sandy loam about 5 inches thick. The upper part of the subsoil is red loam to a depth of 42 inches. The lower part is yellowish red sandy loam to a depth of 52 inches and sandy clay loam to a depth of 72 inches or more.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout, unless the surface layer has been limed. Permeability and available water capacity are moderate. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are soils that have a dark red surface layer. Also included are a few intermingled areas of Bama, Flomaton, Luverne, Pikeville, and Ruston soils. The included soils make up about 15 percent of this map unit.

Most of the acreage of this soil is used as woodland. Some areas have been cleared and used for cultivated crops and pasture. Cultivated areas are generally planted to corn and small grains.

This soil is fairly suited to cultivated crops and is well suited to pasture. Steep, complex slopes are limitations for the use of equipment and increase the hazard of erosion. The hazard of erosion is moderate if cultivated crops are grown. Terraces, minimum tillage, and the use of cover crops in the cropping system, including grasses and legumes, help to slow runoff and control erosion.

This Smithdale soil is well suited to loblolly pine and longleaf pine. There are no significant limitations for woodland use or management. The soil is well suited to use as woodland wildlife habitat.

This soil is well suited to most urban uses. Moderate limitations for urban uses are present on slopes of more than 8 percent.

The Smithdale soil is in capability subclass IIIe and woodland group 3o.

34—Smithdale fine sandy loam, 15 to 35 percent slopes. This deep, well drained soil is on side slopes of the Coastal Plain uplands. Slopes range from 15 to 35 percent. Individual areas range from 6 to 2,100 acres.

Typically, the surface layer is dark brown fine sandy loam about 5 inches thick. The upper part of the subsoil is red loam to a depth of 42 inches. The lower part is yellowish red sandy loam to a depth of 52 inches and sandy clay loam to a depth of 72 inches or more.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability and available water capacity are moderate. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few areas of a soil that is similar to the Smithdale soil except that it has a sandier subsoil. Also included are a few small areas of Bibb, Flomaton, Luverne, and Pikeville soils. Included soils make up about 20 percent of this map unit.

Most of this Smithdale soil is used as woodland. A few areas are used for pasture.

This soil is poorly suited to cultivated crops because of steep slopes and a severe hazard of erosion. It is fairly suited to pasture and hay. Steep slopes are a moderate limitation.

The Smithdale soil is well suited to loblolly pine and longleaf pine. Plant competition is a moderate limitation. This soil is well suited to use as woodland wildlife habitat.

This soil is fairly suited to most urban uses because of steep slopes. This limitation can be overcome by proper engineering design.

The Smithdale soil is in capability subclass VIIe and woodland group 3o.

35—Smithdale-Flomaton complex, 15 to 35 percent slopes. This map unit consists of small areas of Smithdale and Flomaton soils that are so intermingled that it was not practical to map them separately. These deep, well drained and excessively drained soils are on upper side slopes and ridgetops. Slopes range from 15 to 35 percent. Individual areas range from 10 to 2,800 acres.

Smithdale fine sandy loam makes up about 45 percent of each mapped area. Typically, the surface layer is dark brown fine sandy loam about 5 inches thick. The upper part of the subsoil is red loam to a depth of 42 inches. The lower part is yellowish red sandy loam to a depth of 52 inches and sandy clay loam to a depth of 72 inches or more.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability and available water capacity are moderate. The root zone is deep and easily penetrated by plant roots.

Flomaton very gravelly loamy sand makes up about 20 percent of each mapped area. Typically, the surface layer is dark brown very gravelly loamy sand about 5 inches thick. The subsurface layer is brownish yellow and yellow very gravelly loamy sand to a depth of 27 inches. Below that is yellow gravelly loamy sand and layers of yellowish red very gravelly sandy loam to a depth of 72 inches or more.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout the profile. Permeability is rapid, and available water capacity is very low.

Included with this complex in mapping are some areas of Bama, Montevallo, and Nauvoo soils. Included soils make up about 35 percent of this unit.

The soils in this complex are mostly used as woodland. Some small areas, however, are used for pasture and hay. The hazard of erosion is severe if cultivated crops are grown.

These soils are poorly suited to cultivated crops. They are fairly suited to pasture and hay. Steep slopes and the hazard of erosion are severe limitations.

The soils in this complex are fairly suited to loblolly pine and longleaf pine. The hazard of erosion, equipment limitation, and seedling mortality are moderate. These soils are fairly suited to use as woodland wildlife habitat.

These soils are poorly suited to most urban uses. Steep slopes and the large amount of gravel and sand are severe limitations. The slope limitation can be overcome by proper engineering design.

The soils in this complex are in capability subclass VIIe. The Smithdale soil is in woodland group 3o, and the Flomaton soil is in woodland group 4f.

36—Smithdale-Luverne complex, 15 to 35 percent slopes. This map unit consists of areas of Smithdale and Luverne soils that are so intermingled that it was not practical to map them separately. These deep, well drained soils are on side slopes and narrow ridgetops of the Coastal Plain uplands. Slopes range from 15 to 35 percent. Individual areas range from 10 to 3,000 acres.

Smithdale fine sandy loam makes up about 45 percent of each mapped area. Typically, the surface layer is brown fine sandy loam about 5 inches thick. The upper part of the subsoil is red loam to a depth of 42 inches. The lower part is yellowish red sandy loam to a depth of 52 inches and sandy clay loam to a depth of 72 inches or more.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability and available water capacity are moderate. Tilth is good, and the soil can be worked throughout a wide range in moisture content. The root zone is deep and easily penetrated by plant roots.

Luverne fine sandy loam makes up about 30 percent of each mapped area. Typically, the surface layer is dark yellowish brown fine sandy loam about 4 inches thick. The subsoil is dark red clay and sandy clay to a depth of about 39 inches. The underlying material is stratified, yellowish red loamy sand and clay.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability is moderately slow, and available water capacity is moderate. The root zone is deep and easily penetrated by plant roots.

Included with these soils in mapping are a few areas of soils that are similar to the Smithdale soil but that have a sandier subsoil. Also included are a few small areas of Bibb, Pikeville, and Flomaton soils. Included soils make up about 25 percent of this map unit.

The soils in this complex are used as woodland. Some small areas are cleared and used for pasture.

These soils are poorly suited to cultivated crops. Steep slopes and the hazard of erosion are severe limitations. The soils are fairly suited to pasture and hay. Steep slopes are a moderate limitation.

The soils in this complex are well suited to loblolly pine and longleaf pine. The moderate hazard of erosion, seedling mortality, and equipment limitation are the main management concerns. These soils are well suited to use as woodland wildlife habitat.

These soils are poorly suited to most urban uses. Slope and the moderately slow permeability of the Luverne soil are severe limitations. Low strength is a severe limitation if these soils are used for local roads and streets and roadfill. Most of these limitations can be overcome by proper engineering design and installation.

Both soils are in capability subclass VIIe. The Smithdale soil is in woodland group 3o, and the Luverne soil is in woodland group 3c.

37—Smithdale-Urban land complex, 6 to 15 percent slopes. This map unit consists of Smithdale soil and Urban land in small areas that are so intermingled that it was not practical to map them separately. The deep, well drained Smithdale soil and the Urban land are on narrow ridgetops and side slopes. Slopes are smooth and convex. They range from 6 to 15 percent. Individual areas range from 20 to 160 acres.

Smithdale fine sandy loam makes up about 55 percent of each mapped area. Typically, the surface layer is dark brown fine sandy loam about 5 inches thick. The upper part of the subsoil is red loam that extends to a depth of 42 inches. The lower part is yellowish red sandy loam to

a depth of 52 inches and sandy clay loam to a depth of 72 inches or more. In many areas the soil has been significantly disturbed or modified by cutting, filling, or grading.

This soil is low is natural fertility and organic matter content. Reaction is strongly acid or very strongly acid, unless the surface layer has been limed. Permeability and available water capacity are moderate. The root zone is deep and easily penetrated by plant roots.

Urban land makes up about 40 percent of each mapped area. It consists of areas that are covered by sidewalks, patios, driveways, parking lots, and streets and buildings, such as churches, schools, homes, and small businesses.

Included with this complex in mapping are a few small areas of Bama, Flomaton, Luverne, and Pikeville soils. Included soils make up about 5 percent of this unit.

The Smithdale soil is fairly suited to most recreation uses (fig. 10). Slope is a moderate limitation for camp areas and picnic areas and a severe limitation for playgrounds.

This soil is well suited to most engineering uses. The risk of corrosion of uncoated steel and concrete is moderate. The soil is fairly suited to most urban uses. Slope is a moderate limitation, but this limitation can usually be overcome by proper engineering design.

This soil is well suited to vegetable gardens and plants used in landscaping.

The Smithdale soil and Urban land are not in a capability subclass or woodland group.

38—Smithdale association, hilly. This map unit consists of deep, well drained soils on uplands of the Coastal Plain. This soil formed in sandy and loamy marine sediments. Slopes range from 10 to 25 percent. Individual areas range from 160 to 2,400 acres.

Smithdale fine sandy loam and closely similar soils make up about 70 percent of each mapped area. Typically, the surface layer is dark brown fine sandy loam about 5 inches thick. The upper part of the subsoil is red loam to a depth of 42 inches. The lower part is yellowish red sandy loam to a depth of 52 inches and sandy clay loam to a depth of 72 inches or more.

This Smithdale soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability and available water capacity are moderate. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Bama, Iuka, Luverne, Nauvoo, and Pikeville soils. Dissimilar soils make up about 30 percent of this map unit.

Most of this soil is used as woodland. Some areas are used for pasture and hay and planted to bahiagrass and coastal bermudagrass.

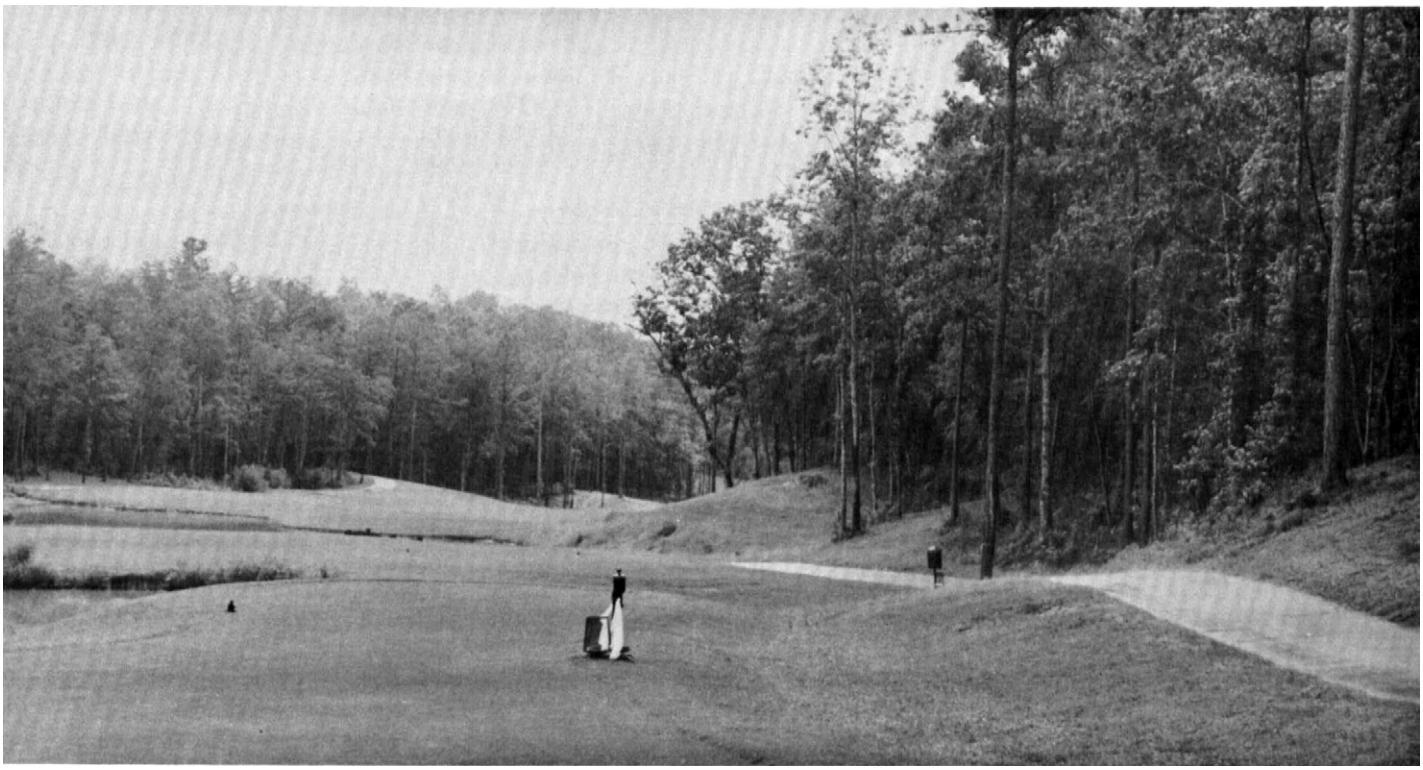

Figure 10.—This area of Smithdale fine sandy loam, 6 to 15 percent slopes, is being used as a golf course.

Figure 11.—Loblolly pines that have undergone control burning to reduce plant competition on Smithdale association, hilly.

The Smithdale soil is not suited to cultivated crops. Slope and the hazard of erosion are severe limitations. This soil is fairly suited to pasture and hay.

This soil is well suited to loblolly pine and longleaf pine. Plant competition is a moderate limitation (fig. 11). The soil is well suited to use as woodland wildlife habitat. A large acreage of this soil is presently in a game reserve.

This soil is poorly suited to most urban uses. Slope is a severe limitation.

The Smithdale soil is in capability subclass VIIe and woodland group 3o.

39—Smithdale-Luverne association, hilly. This map unit consists of deep, well drained soils on dissected uplands of the Coastal Plain. These soils formed in clayey and sandy stratified marine sediments. Slopes range from 10 to 35 percent. Individual areas range from 300 to 3,500 acres.

Smithdale fine sandy loam makes up about 50 percent of the unit. Typically, the surface layer is dark brown fine sandy loam about 5 inches thick. The upper part of the subsoil is red loam to a depth of 42 inches. The lower part is yellowish red sandy loam to a depth of 52 inches and sandy clay loam to a depth of 72 inches or more.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid throughout. Permeability and available water capacity are moderate. The root zone is deep and easily penetrated by plant roots.

Luverne fine sandy loam makes up about 30 percent of the unit. Typically, the surface layer is dark yellowish brown fine sandy loam about 4 inches thick. The subsoil is dark red clay and sandy clay to a depth of about 39 inches. The underlying material is stratified, yellowish red loamy sand and clay.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability is moderately slow, and available water capacity is moderate. The root zone is deep and easily penetrated by plant roots.

Included with these soils in mapping are a few areas of soils that are similar to the Smithdale soil but that have a sandier subsoil. Also included are a few small areas of Bibb, Boswell, Flomaton, and Pikeville soils. Included soils make up about 20 percent of this map unit.

Most of the soils in this unit are used as woodland. A few small areas are cleared and used for pasture.

These soils are poorly suited to cultivated crops. Steep slopes and the hazard of erosion are severe limitations. The soils are fairly suited to pasture and hay. Steep slopes are a moderate limitation for equipment use.

The soils in this unit are well suited to loblolly pine and longleaf pine. The hazard of erosion, seedling mortality, and restricted use of equipment are the main limitations. These soils are well suited to use as woodland wildlife habitat.

These soils are poorly suited to most urban uses. Slope and the moderately slow permeability of the Luverne soil are severe limitations. Low strength is a severe limitation if the soils are used for local roads and streets and roadfill. Most of these limitations can be overcome to some extent by proper engineering design and installation.

Both soils are in capability subclass VIIe. The Smithdale soil is in woodland group 3o, and the Luverne soil is in woodland group 3c.

40—Smithdale-Pikeville association, hilly. This map unit consists of deep, well drained soils on dissected uplands of the Coastal Plain. These soils formed in loamy and gravelly marine sediments. Slopes range from 10 to 35 percent. Individual areas range from 200 to 7,000 acres.

The Smithdale soil and similar soils make up about 40 percent of the unit. Typically, the surface layer is dark brown fine sandy loam about 5 inches thick. The upper part of the subsoil is red loam to a depth of 42 inches. The lower part is yellowish red sandy loam to a depth of 52 inches and sandy clay loam to a depth of 72 inches.

This Smithdale soil is low is natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability and available water capacity are moderate. The root zone is deep and easily penetrated by plant roots.

The Pikeville soil and similar soils make up about 30 percent of the unit. Typically, the surface layer is dark grayish brown sandy loam about 7 inches thick. The subsurface layer is yellowish brown sandy loam to a depth of 13 inches. The upper part of the subsoil is yellowish red sandy loam and sandy clay loam to a depth of 31 inches. The lower part is yellowish red very gravelly sandy clay loam to a depth of 72 inches or more.

This Pikeville soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid. Permeability and available water capacity are moderate.

Included with these soils in mapping are a few small areas of Bibb, Flomaton, Montevallo, and Nauvoo soils. Included soils make up about 30 percent of this map unit.

The soils in this association are mainly used as woodland. They are poorly suited to cultivated crops. Slope and the hazard of erosion are severe limitations. The soils are fairly suited to pasture and hay because steep slopes restrict the use of equipment in most areas.

These soils are well suited to loblolly pine. The equipment limitation and plant competition are the main management concerns. The soils are well suited to use as woodland wildlife habitat.

These soils are fairly suited to most urban uses. Slope is a severe limitation for septic tank absorption fields, dwellings, and local roads and streets.

Both soils are in capability subclass VIIe. The Smithdale soil is in woodland group 3o, and the Pikeville soil is in woodland group 3f.

41—Urban land. This map unit is made up of extensively built-up areas. Eighty-five to 100 percent of each mapped area is either covered by structures or has been disturbed by cutting and filling.

Most of these areas are nearly level or gently sloping. Storm drainage systems usually control runoff on the paved areas, but erosion is severe on many of the exposed cuts or fills.

Included with Urban land in mapping are small areas of moderately built-up land; structures cover 50 to 75 percent of the surface. Also included are remnants of undisturbed soils and areas of natural soil that are covered by fill material. Included areas make up as much as 15 percent of the unit.

Urban land is not in a capability subclass or woodland group.

prime farmland

Prime farmland is one of several kinds of important farmlands defined by the U.S. Department of Agriculture. It is of major importance in providing the Nation's short- and long-range needs for food and fiber. The supply of high quality farmland is limited. The U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, must encourage and facilitate the use of our Nation's prime farmland with wisdom and foresight.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that is best suited to producing food, feed, forage, fiber, and oilseed crops. This land has the quality, growing season, and moisture supply needed to economically produce a sustained high yield of crops if it is treated and managed using acceptable farming methods. Prime farmland produces the highest yields with minimal inputs of energy and economic resources, and farming it results in the least damage to the environment.

This land includes areas that are currently being used for crops, pasture, woodland, or other purposes, except for urban and built-up land or water areas. The land must either be used for producing food or fiber or be available for these uses.

Prime farmland generally has an adequate and dependable supply of moisture from precipitation or irrigation. It also has a favorable temperature and growing season and an acceptable level of acidity or alkalinity. This land has few or no rocks and is permeable to water and air. Prime farmland is not excessively erosive or saturated with water for long periods and is not flooded during the growing season. Slope ranges mainly from 0 to 6 percent. For more detailed information regarding the criteria for prime farmland, consult the local staff of the Soil Conservation Service.

About 69,543 acres or approximately 8 percent of the soils in Tuscaloosa County meets the requirements for prime farmland. Areas of these soils are scattered throughout the county, but most are on terraces of the Black Warrior River and its tributaries. Most of the prime farmland is in general soil map units 1, 3, and 4.

A recent trend in land use in some parts of the county has resulted in the loss of some prime farmland to industrial and urban uses. This loss puts demands on marginal lands, which generally are more erosive, droughty, difficult to cultivate, and generally less productive.

The detailed map units that make up prime farmland in Tuscaloosa County are listed in this section. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps at the back of this survey. The soil qualities that affect use and management are described in the section "Detailed soil map units."

The map units listed below meet the requirements for prime farmland, unless the soils are urban or built-up land. Urban or built-up land is any contiguous unit of land of 10 acres or more that is used for residences, industrial sites, commercial sites, construction sites, institutional sites, public administration sites, railroad yards, small parks, cemeteries, airports, golf courses, sanitary landfills, sewage treatment plants, water control structures and spillways, or shooting ranges.

5—Bama fine sandy loam, 0 to 2 percent slopes
6—Bama fine sandy loam, 2 to 6 percent slopes
13—Cahaba sandy loam
14—Choccolocco silt loam
15—Decatur loam, 2 to 8 percent slopes
16—Dundee silt loam
18—Falkner silt loam
27—Ruston fine sandy loam, 0 to 2 percent slopes
28—Ruston fine sandy loam, 2 to 6 percent slopes
29—Shatta silt loam, 0 to 2 percent slopes
30—Shatta silt loam, 2 to 6 percent slopes

use and management of the soils

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

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

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

crops and pasture

Robert F. Berry, conservation agronomist, Soil Conservation Service, helped prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, 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.

In 1970 there was approximately 68,000 acres of cropland and 32,000 acres of pastureland in the county (*2*). Row crops and close-growing crops were grown on 39,000 acres of cropland. The remaining cropland was used for conservation practices, as hayland, or was idle. In 1978, approximately 11,300 acres of soybeans, 7,150 acres of cotton, and 3,900 acres of corn were planted in Tuscaloosa County (*15*). There was also 11,700 acres of hay harvested in 1978.

The acreage planted to cultivated crops has been decreasing in recent years, and the acreage used as pastureland has been increasing. The trend toward increases in urban land has continued in recent years.

The potential of the soils in Tuscaloosa County for increased production of food and fiber is good. About 80,000 acres of potentially good cropland is being used as pastureland and woodland. Approximately 45,000 acres is lowlands, which require some drainage. Yields can be increased on land that is currently being cultivated if the most recent technology is applied. This soil survey can help land users make sound land management decisions and facilitate the application of crop production technology.

Soil erosion is a major problem on about three-fourths of the cropland and one-half of the pastureland in Tuscaloosa County. If the slope is more than 2 percent, erosion is a potential hazard. Bama, Cahaba, Nauvoo, Ruston, Shatta, and Smithdale soils are some of the soils that have slopes of 2 percent or more and are presently being cultivated. Shatta soils also have a wetness problem.

Loss of soil through erosion is damaging in several ways. Productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer. Loss of the surface layer is especially damaging on soils, such as Boswell soils, that have a clayey subsoil and on soils that have a layer in or below the subsoil that restricts the rooting depth. Such layers include the fragipan in Shatta soils and the bedrock of Nauvoo soils. Erosion results in sediment that causes

offsite damages. Controlling erosion on farmland minimizes the pollution of streams by sediment and improves the quality of water for municipal use, recreation, and fish and wildlife.

The sandy soils of the Coastal Plain have traffic pans if they are used for cultivated crops. The use of large tractors and heavy equipment results in compacted layers, normally at a depth of 2 to 12 inches. These traffic pans restrict infiltration of water and plant roots. Soils that are most affected by traffic pans are Bama, Cahaba, Ruston, Shatta, and Smithdale soils.

The survey area has an adequate amount of rainfall for crops that are commonly grown; however, the distribution of rainfall during spring and summer is usually such that periods of drought occur practically every year. Irrigation is needed to prevent drought stress periods. All soils commonly used for cultivated crops are suited to irrigation.

Seedbed preparation and cultivation are difficult on eroded, clayey, or fragipan areas because the original friable surface layer has been removed. Such conditions are common in areas of Boswell, Luverne, and Shatta soils.

Erosion control practices provide protective surface cover, reduce runoff, and increase infiltration. A cropping system that keeps a plant cover and crop residue on the surface for extended periods can hold soil losses to amounts that do not reduce the productive capacity of the soils. On livestock farms, legume and grass forage crops can be incorporated into the cropping system to reduce erosion on sloping areas. They also provide nitrogen and improve tilth for the crops that follow in the rotation.

Conservation tillage and leaving crop residue on the surface help to increase infiltration and reduce the hazards of runoff and erosion. These practices can be adapted to most soils in the survey area. No-tillage for corn and soybeans is effective in reducing erosion on sloping areas. This practice also can be adapted to most soils in the survey area and can be used in areas where the topography is unfavorable for terracing or contouring.

Terraces and diversions reduce the length of slopes and reduce runoff and erosion. They are most practical on deep, well drained and moderately well drained, sloping soils, such as Bama, Cahaba, Ruston, Nauvoo, Shatta, and Smithdale soils. Other soils in the survey area are less suitable for terracing because they have irregular slopes or a clayey subsoil, which would be exposed in the terrace channels. Diversions are most practical on toe slopes and benches that intercept surface runoff from hilly uplands and divert the water from the lower lying cropland fields. Contour farming is very effective in reducing erosion on cropland. This practice is best suited to soils that have smooth, uniform slopes.

Information regarding erosion control practices for each kind of soil is available in the local office of the Soil Conservation Service.

Soil drainage is needed on several soils in the county. Some soils are naturally too wet for producing crops and pasture plants that are common in the area. On other soils, drainage can increase crop and pasture production. These other soils are the poorly drained Amy and Adaton soils and the somewhat poorly drained Augusta, Dundee, Falkner, and Mantachie soils.

Many areas of well drained or moderately well drained soils are intermittently crossed by narrow drainageways. The soils adjacent to the drains are often wet in spring and delay farming operations. Artificial drainage systems can be used to remove excess water from the low lying areas. The areas can be planted earlier, and some turnrows can be eliminated.

Amy, Falkner, and Shatta soils have a perched water table early in spring. The water table is caused by the slow permeability in the lower part of the subsoil. An underground tile drainage system is excellent for removing this perched water table. The land can then be planted earlier, thereby increasing yields. Also, underground drainage systems can be used to intercept seepage water on toe slopes and divert it from the lower lying cropland.

The design of both surface and subsurface drainage systems varies with the kind of soil. A combination of surface drainage and tile drainage is needed in some areas to complete the system. Drains have to be more closely spaced in soils that have slow permeability than in the more permeable soils. Finding adequate outlets for both surface and subsurface drainage systems is difficult in many areas of the county.

Soil fertility is naturally low in most of the soils in the survey area. All but the Brilliant soils are acid. The soils on flood plains and terraces, such as Choccolocco, Mantachie, Ellisville, and Bibb soils, are slightly higher in natural fertility than most upland soils. The soils need applications of ground limestone to raise the pH level sufficiently for optimum utilization of commercial fertilizer by plants. Crops on all of the soils in the survey area respond well to fertilizer. Levels of available phosphorus and potash are low in most of the soils. On all of the soils, additions of lime and fertilizer should be based on the results of soil tests, on the need of crops, and on the expected level of yields. The Cooperative Extension Service can help in determining the kinds and amounts of fertilizer and lime to apply.

Soil tilth is an important factor in seed germination, and it affects the infiltration of water into the soil. Soils that have good tilth have a granular and porous surface layer.

Most of the soils that are used for crops in the survey area have a fine sandy loam or loam surface layer that is light in color and low in organic matter content. The structure of these soils is weak, and intense rainfall often causes a crust to form on the surface. The crust is hard when dry and is almost impervious to water. It reduces infiltration of water and increases runoff. Regular additions of crop residue, manure, and other organic

material can help improve soil structure and reduce crust formation.

Field crops suited to the soils and climate of the survey area include many that are not now commonly grown. Soybeans, cotton, corn, and grain sorghum are the main row crops. Peanuts, potatoes, and similar crops can be grown if economic conditions are favorable. Specialty crops include cucumbers, tomatoes, sweet potatoes, pole beans, peas, sweet corn, greens, and melons. They make up a small acreage. These crops and other specialty crops are well suited to most soils in the county. If economic conditions are favorable, a large acreage can be grown. Pecans and peaches are the only orchard crops grown commercially in the county, but the acreage is small. Apples, plums, and pears are also well suited to the area. Wheat and rye are the only close-growing crops that are planted for grain production. However, oats and barley can be grown.

Information and suggestions for growing specialty crops can be obtained from local offices of the Cooperative Extension Service and the Soil Conservation Service.

Pasture and hay crops are important in the survey area. Tall fescue, bahiagrass, common bermudagrass, hybrid bermudagrasses, and dallisgrass are the main perennial grasses grown for pasture and hay. Wheat, ryegrass, and rye are grown for annual cool-season forage and millet, sorghum, and sorghum-sudan crosses provide most of the annual warm-season forage. These annuals are normally grown on cropland for temporary grazing. Arrowleaf clover, white clover, crimson clover, ball clover, and other cool-season forage legumes grow on most soils in the county, especially if agricultural limestone is applied to the soils in proper amounts. The warm-season forage legumes, such as sericea and annual lespedeza, are well adapted to most soils.

Several management practices are needed on all soils that are used for pasture and hay production. These practices include proper grazing or cutting heights, controlling weeds, proper fertilization, rotational grazing, and scattering animal droppings. Cool-season perennial grasses, such as tall fescue, should not be grazed in summer so that food reserves can be stored in the plants for growth in fall. Overgrazing and low fertilization are the two greatest problems associated with pasture production. Both problems result in weak plants and poor stands that are quickly infested with weeds. The best way to prevent weeds from becoming established is to maintain a good dense ground cover with the desired pasture species.

yields per acre

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

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and 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 includes 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 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils.

land capability classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor does it consider 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 rangeland, 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 slight 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 have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

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

The capability classification of each map unit is given in the section "Detailed soil map units."

woodland management and productivity

Jerry L. Johnson, forester, Soil Conservation Service, helped prepare this section.

Tuscaloosa County has 696,200 acres of commercial forest land, which occupies 81 percent of the county. Forest acreage increased one percent from 1963 to 1972. Private landowners own 75 percent of the forest land; industry owns 22 percent; and government owns the remaining three percent (*8*).

Forest types in Tuscaloosa County are 23,600 acres of longleaf-slash pine; 247,800 acres of loblolly-shortleaf pine; 194,700 acres of oak-pine; 141,600 acres of oak-hickory; and 88,500 acres of oak-gum-cypress. Most of the acreage in the oak-pine and oak-hickory forests is best suited to growing pines. The forests in Tuscaloosa County contain 206,500 acres of sawtimber, 236,000 acres of poletimber, and 253,700 acres of seedlings and saplings (*13*).

About 60 percent of the soils in Tuscaloosa County have a site index of 80 or above for loblolly pine. This includes over 400,000 acres of forest land (*13*).

There are 57 wood-using firms in Tuscaloosa County that employ over 1,000 people. The total labor force in Tuscaloosa County is over 52,000 with a manufacturing labor force of about 9,000 (*3*).

Table 6 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 ordination (woodland suitability) symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential 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; *t*, toxic substances in 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, t, d, c, s, f, and r.

In table 6, *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 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 a few trees may be blown down by normal winds; *moderate*, that some trees will be blown

down during periods of excessive soil wetness and strong winds; and *severe*, that many trees will be blown down during periods of excessive soil wetness and moderate or strong winds.

The *potential 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 was determined at age 30 years for eastern cottonwood, 35 years for American sycamore, and 50 years for all other species. The site index applies to fully stocked, even-aged 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.

Trees to plant are those that are suited to the soils and to commercial wood production.

recreation

The soils of the survey area are rated in table 7 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public 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 recreation 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 7, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 7 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 10 and interpretations for dwellings without basements and for local roads and streets in table 9.

Camp areas require site preparation such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

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

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

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

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

wildlife habitat

Robert E. Waters, biologist, Soil Conservation Service, helped prepare this section.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 8, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; in determining the intensity of management needed for each element of the habitat; and in selecting areas to manage for pay

hunting. The ratings refer to only the potential of the soil, not to present conditions on a particular site. The ratings do not consider present land use, present wildlife habitat, or present wildlife populations. These and other conditions must be determined by onsite examination.

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, soybeans, wheat, oats, sorghums, barley, millets, cowpeas, and sunflower.

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 tall fescue, lovegrass, bahiagrass, bermudagrass, dallisgrass, johnsongrass, lespedezas, orchardgrass, clovers, and vetches.

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 dewberry, blackberry, crotons, pokeweed, partridge peas, crabgrass, and paspalums.

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, yellow-poplar, cherry, sweetgum, hawthorn, dogwood, hickory, persimmon, sassafras, sumacs, black walnut, viburnums, hollies, beech, and hackberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are autumn-olive, crabapple, pyracantha, hollies, and dogwoods.

Coniferous plants furnish browse, seeds, and cones. 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, rushes, sedges, reeds, and cattail.

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, wildlife watering developments, beaver ponds, and other wildlife 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, mourning dove, meadowlark, field sparrow, mockingbird, killdeer, blackbirds, 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, warblers, vireos, squirrels, gray fox, raccoon, deer, and bear.

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

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 need to 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 adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

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

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

building site development

Table 9 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, 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.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

sanitary facilities

Table 10 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 10 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to effectively filter the effluent. 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 10 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, 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 10 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 11 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

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

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help 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 11, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

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

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as 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 12 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and 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 for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

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. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. These results are reported in table 18.

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 13 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil series and their morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages 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 a soil contains particles coarser than sand, 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 (*6*) and the system adopted by the American Association of State Highway and Transportation Officials (*5*).

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

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 18.

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 oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

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

physical and chemical properties

Table 14 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate 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 adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth-moving operations.

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 is given in inches of water per inch of soil for each major soil layer. 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 in tons per acre per year. The 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 0.05 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 without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition.

In table 14, the estimated content of organic matter of the plow layer 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 15 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation 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 a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

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

Table 15 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in 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 15 are the depth to the seasonal high water table; the kind of water table—that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 15.

An apparent water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. An artesian water table is under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. 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.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

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 severe corrosion 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 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 16 and the results of chemical analysis in table 17. 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 Agronomy and Soils Mineralogy Laboratory at Auburn University, Auburn, Alabama.

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 ovendry basis. The methods used in obtaining the data are indicated in the list that follows. The codes in parentheses refer to published methods codes.

Sand—(0.05-2.0 mm fraction) weight percentages of materials less than 2 mm (3A1) (*11*).

Silt—(0.002-0.05 mm fraction) pipette extraction, weight percentages of all materials less than 2 mm (3A1) (*11*).

Clay—(fraction less than 0.002 mm) pipette extraction, weight percentages of materials less than 2 mm (3A1) (*11*).

Extractable bases—method of Hajek, Adams, and Cope (*7*).

Extractable acidity—method of Hajek, Adams, and Cope (*7*).

Cation-exchange capacity—sum of cations (5A3a) (*11*).

Cation-exchange capacity—ammonium chloride (5A7a) (*11*).

Base saturation—method of Hajek, Adams, and Cope (*7*).

Reaction (pH)—1:1 water dilution (8C1a) (*11*).

engineering index test data

Table 18 shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are typical of the series and are described in the section "Soil series and their morphology." The soil samples were tested by the State of Alabama Highway Department Soils Laboratory.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

The tests and methods are: AASHTO classification—M 145 (AASHTO), D 3282 (ASTM); Unified classification—D 2487 (ASTM); Grain-size distribution—T 88 (AASHTO), D 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 423 (ASTM); Plasticity index—T 90 (AASHTO), D 424 (ASTM); Moisture density, Method A—T 99 (AASHTO), D 698 (ASTM).

classification of the soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*14*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. In table 19, the soils of the survey area are classified according to the system. 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-loamy, mixed, nonacid, mesic 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. The texture of the surface layer or of the substratum can differ 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 (*10*). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (*14*). 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 silty fluvial sediments. These soils are on broad stream terraces and in depressions of the Coastal Plains and are subject to rare flooding. Slopes range from 0 to 2 percent.

Adaton soils are geographically associated with Dundee and Falkner soils. Dundee and Falkner soils are somewhat poorly drained. They are at a slightly higher elevation than Adaton soils.

Typical pedon of Adaton silt loam in a pasture, 100 feet north and 1,500 feet east of the southwest corner of sec. 25, T. 22 S., R. 11 W:

Ap—0 to 2 inches; dark gray (10YR 4/1) silt loam; weak fine subangular blocky structure; friable; many fine roots; common fine mica flakes; very strongly acid; clear wavy boundary.
A2—2 to 7 inches; grayish brown (10YR 5/2) silt loam; weak fine subangular blocky structure; friable; many fine roots; common fine mica flakes; very strongly acid; clear wavy boundary.
B21tg—7 to 20 inches; light gray (10YR 6/1) silt loam; common medium distinct yellowish brown mottles (10YR 5/8); weak medium subangular blocky structure; friable; patchy distinct clay films on faces of peds; few fine roots; few fine mica flakes; strongly acid; gradual wavy boundary.
B22tg—20 to 31 inches; light gray (10YR 6/1) silt loam; common medium distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable; patchy distinct clay films on faces of peds; few fine mica flakes; strongly acid; gradual wavy boundary.
B23tg—31 to 46 inches; light gray (10YR 6/1) silty clay loam; many medium distinct yellowish brown (10YR 5/8) and pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable; broken distinct clay films on faces of peds; few fine mica flakes; very strongly acid; gradual wavy boundary.
B24tg—46 to 58 inches; mottled light gray (10YR 6/1) and grayish brown (10YR 5/2) silty clay loam; many medium distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable; continuous distinct clay films on faces of peds; few fine mica flakes; very strongly acid; gradual wavy boundary.
B25tg—58 to 79 inches; light gray (10YR 6/1) silty clay loam; common medium prominent strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; firm; patchy faint clay films on faces of peds; few fine mica flakes; very strongly acid; gradual wavy boundary.
Cg—79 to 96 inches; light brownish gray (2.5Y 6/2) loam; massive; few fine mica flakes; very strongly acid.

Solum thickness is more than 60 inches. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid.

The A horizon has hue of 10YR, value of 4 through 6, and chroma of 1 or 2. Texture is silt loam or loam.

The B2t horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2; or it has hue of 2.5Y, value of 6, and chroma of 2. Mottles are in shades of yellow and brown. Texture is silt loam or silty clay loam.

The C horizon has colors similar to those of the lower part of the Bt horizon. Texture is silty clay loam, loam, or sandy loam.

Allen series

The Allen series consists of deep, well drained, moderately permeable soils that formed in loamy colluvium underlain by limestone. These sloping to steep soils are mostly on broad sloping ridgetops and foot slopes in the chert and limestone area of the county. Slopes range from 8 to 35 percent.

Allen soils are geographically associated with Bodine and Decatur soils. Bodine soils are generally in the same position on the landscape as Allen soils but have more than 35 percent chert fragments in the control section. Decatur soils are on higher convex ridges and have a clayey control section that is in shades of dark red.

Typical pedon of Allen fine sandy loam in an area of Allen-Bodine complex, 8 to 15 percent slopes; in a wooded area, 835 feet south and 670 feet east of the northwest corner of sec. 5, T. 21 S. , R. 5 W:

A1—0 to 4 inches; brown (10YR 5/3) fine sandy loam; weak fine granular structure; very friable; common fine and medium roots; medium acid; clear wavy boundary.
A2—4 to 9 inches; yellowish brown (10YR 5/4) loam; weak medium granular structure; very friable; common medium roots; medium acid; clear wavy boundary.
B1—9 to 15 inches; yellowish red (5YR 5/6) loam; weak fine subangular blocky structure; friable; common medium roots; strongly acid; gradual wavy boundary.
B21t—15 to 29 inches; yellowish red (5YR 4/8) sandy clay loam; moderate fine subangular blocky structure; friable; patchy distinct clay films on faces of peds; few medium roots; very strongly acid; gradual wavy boundary.
B22t—29 to 46 inches; yellowish red (5YR 4/8) sandy clay loam; common medium distinct brownish yellow (10YR 6/6) mottles; moderate medium subangular blocky structure; friable; continuous distinct clay films on faces of peds; few chert fragments; very strongly acid; gradual wavy boundary.
B23t—46 to 60 inches; red (2.5YR 4/8) sandy clay loam; common medium distinct reddish yellow (5YR 6/6) and yellowish red (5YR 5/8, 4/8) mottles; weak fine subangular blocky structure; friable; patchy distinct clay films on faces of peds; few small chert fragments; very strongly acid.

Solum thickness ranges from 60 to 80 inches or more. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is fine sandy loam, loam, or silt loam. The A horizon contains less than 5 percent chert fragments by volume.

The B1 horizon, if present, has hue of 5YR, value of 4 or 5, and chroma of 6 or 8. The Bt horizon has hue of 5YR and 2.5YR, value of 3 through 6, and chroma of 6

or 8. Texture is sandy clay loam or clay loam. From about 29 to 60 inches are mottles in shades of yellow, brown, and red. Content or chert fragments ranges from 5 to 10 percent by volume.

Amy series

The Amy series consists of deep, poorly drained, slowly permeable soils that formed in thinly stratified loamy material on stream terraces. These nearly level soils are in depressional areas. They are saturated during wet periods. Slopes range from 0 to 2 percent but are generally less than 1 percent. Amy soils are frequently flooded.

Amy soils are geographically associated with Augusta, Bibb, and Mantachie soils. The Augusta soils are at a slightly higher elevation and are better drained. Bibb soils are on narrower drainageways and have a coarse-loamy control section. Mantachie soils are better drained and do not have an argillic horizon.

Typical pedon of Amy silt loam in an area of Augusta-Amy complex, frequently flooded; in a wooded area, 4 feet north and 2,440 feet east of the southwest corner of sec. 20, T. 20 S., R. 12 W:

A1—0 to 5 inches; grayish brown (10YR 5/2) silt loam; common fine faint light brownish gray (10YR 6/2) and dark brown (10YR 3/3) mottles; weak fine granular structure; friable; large amount of organic matter in some voids; very strongly acid; gradual wavy boundary.

A2g—5 to 14 inches; light brownish gray (10YR 6/2) silt loam; common fine faint pale brown (10YR 6/3), light yellowish brown (10YR 6/4), and yellowish brown (10YR 5/6) mottles; weak fine granular structure; friable; very strongly acid; gradual wavy boundary.

B21tg—14 to 31 inches; light gray (10YR 6/1) silt loam; common medium distinct pale brown (10YR 6/3), light yellowish brown (10YR 6/4), and brownish yellow (10YR 6/6) mottles; weak medium granular structure; slightly firm; few patchy faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

B22tg—31 to 48 inches; mottled gray (10YR 6/1) and light brownish gray (10YR 6/2) silty clay loam; many medium distinct yellowish brown (10YR 5/6, 5/8) mottles; weak medium granular structure; firm; few patchy distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

Cg—48 to 60 inches; mottled gray (10YR 6/1), light brownish gray (10YR 6/2), and pale brown (10YR 6/3) loam; massive; firm; very strongly acid.

Solum thickness ranges from 40 to more than 60 inches. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid.

The A1 horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. The A2 horizon, if present, has hue of 10YR, value of 6, and chroma of 1 or 2. Mottles are in shades of brown.

The B horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. Texture is silt loam or silty clay loam. Mottles are in shades of brown.

The C horizon is varied in color and is stratified with silt loam, loam, or silty clay loam.

Augusta series

The Augusta series consists of deep, somewhat poorly drained, moderately permeable soils that formed in loamy alluvial sediments. These nearly level soils are on the flood plains of the Sipsey River and are frequently flooded. They are saturated late in winter and early in spring. Slopes range from 0 to 2 percent but are dominantly less than 1 percent.

Augusta soils are geographically associated with Amy, Bibb, and Mantachie soils. The Amy soils are in depressions and sloughs and have a fine-silty control section. Bibb soils are along narrow streams and have a coarse-loamy control section. Mantachie soils are on medium size bottoms throughout the county and have a fine-loamy control section.

Typical pedon of Augusta loam in an area of Augusta-Amy complex, frequently flooded; in a wooded area, 10 feet north and 2,340 feet east of the southwest corner of sec. 20, T. 20 S., R. 12 W:

A1—0 to 5 inches; dark brown (10YR 4/3) loam; common medium faint dark yellowish brown mottles; weak medium granular structure; friable; few fine brown and black stains; very strongly acid; abrupt smooth boundary.

A2—5 to 9 inches; light yellowish brown (10YR 6/4) loam; common medium faint light brownish gray (10YR 6/2) mottles; weak fine blocky structure; friable; few brown and black stains; very strongly acid; abrupt wavy boundary.

B21t—9 to 24 inches; light yellowish brown (10YR 6/4) clay loam; common medium distinct dark yellowish brown (10YR 3/4) mottles and light brownish gray (10YR 6/2) coatings on ped exteriors; weak medium granular structure; friable; few patchy distinct clay films on faces of peds; very strongly acid; clear wavy boundary.

B22tg—24 to 35 inches; mottled, light brownish gray (10YR 6/2) and yellowish brown (10YR 5/6) clay; weak medium subangular blocky structure; friable; few patchy distinct clay films on faces of peds; few brown and black stains; few mica flakes; very strongly acid; abrupt smooth boundary.

B3g—35 to 59 inches; light brownish gray (10YR 6/2) clay; many medium distinct dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; friable to slightly firm; very strongly acid; gradual wavy boundary.

IIC—59 to 72 inches; dark yellowish brown (10YR 4/4) sandy loam; massive; many fine mica flakes; very strongly acid.

Solum thickness ranges from 40 to more than 60 inches. Unless the surface layer has been limed, reaction ranges from medium acid to very strongly acid.

The A horizon has hue of 10YR, value of 4 through 6, and chroma of 2 through 4. Texture is fine sandy loam, loam, or silt loam.

The B21t horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. Mottles are in shades of gray and brown. Texture is loam, clay loam, or sandy clay loam. The B22tg and B3g horizons have hue of 10YR, value of 5 or 6, and chroma of 2 through 6. Mottles are in shades of yellow, brown, and gray. There are a few brown and black stains throughout the B horizon. In the lower part, there are few to many mica flakes.

The IIC horizon has hue of 10YR, value of 3 through 5, and chroma of 3 through 6. Texture ranges from sandy loam to silty clay loam. Mottles are in shades of gray and brown.

Bama series

The Bama series consists of deep, well drained, moderately permeable soils that formed in thick beds of loamy marine sediments. These soils are on broad ridgetops and plateaus of the Coastal Plain uplands. Slopes range from 0 to 6 percent.

Bama soils are geographically associated with Smithdale, Luverne, Ruston, and Boswell soils. Smithdale soils are on side slopes and narrow ridgetops. Luverne and Boswell soils have a clayey control section and are on steeper slopes. Ruston soils have a bisequal profile.

Typical pedon of Bama fine sandy loam, 2 to 6 percent slopes; in a stand of pine, 20 feet north and 1,837 feet west of the southeast corner of sec. 16, T. 20 S., R. 10 W:

Ap—0 to 5 inches; brown (10YR 4/3) fine sandy loam; weak medium subangular blocky structure parting to weak fine granular; friable; many fine roots; strongly acid; gradual wavy boundary.

B21t—5 to 18 inches; red (2.5YR 4/6) clay loam; weak medium subangular blocky structure; friable; few fine and medium roots; patchy distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

B22t—18 to 30 inches; yellowish red (5YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable; few fine and medium roots; patchy faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

B23t—30 to 54 inches; red (2.5YR 4/6) loam; weak medium subangular blocky structure; friable; continuous distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

B24t—54 to 61 inches; red (2.5YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable; patchy distinct clay films on faces of peds; pockets of uncoated yellowish brown (10YR 5/4) sand grains; very strongly acid; gradual wavy boundary.

B25t—61 to 72 inches; red (2.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; patchy faint clay films on faces of some peds; pockets of clay loam material; very strongly acid.

Solum thickness is more than 72 inches. Unless the surface has been limed, reaction is strongly acid or very strongly acid. Gravel content is generally less than 5 percent but ranges to as much as 10 percent in some pedons.

The A horizon has hue of 10YR, value of 3 through 5, and chroma of 2 through 4. Texture is fine sandy loam, sandy loam, or loam.

The B1 horizon, if present, has hue of 5YR, value of 4 or 5, and chroma of 4 through 8. Texture is loam or sandy loam. The B2t horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8. In some pedons the lower part of the B2t horizon has hue of 10R, value of 3, and chroma of 6. Mottles are in shades of yellow and brown. Texture is loam, sandy clay loam, or clay loam.

Bibb series

The Bibb series consists of deep, poorly drained, moderately permeable soils that formed in sandy fluvial deposits on stream terraces of the Coastal Plain. These soils are frequently flooded and are subject to scouring and uneven deposition of overwash. Slopes range from 0 to 2 percent.

Bibb soils are geographically associated with Amy, Augusta, Iuka, and Mantachie soils. Amy soils are poorly drained and have a fine-silty control section. Iuka soils are at a slightly higher elevation and are moderately well drained. Augusta and Mantachie soils have a fine-loamy control section and are somewhat poorly drained.

Typical pedon of Bibb sandy loam in an area of Bibb soils, frequently flooded; in a narrow stream bottom, 585 feet south and 2,000 feet east of the northwest corner of sec. 19, T. 19 S., R. 10 W:

A—0 to 10 inches; dark brown (10YR 4/3) sandy loam; weak fine granular structure; very friable; many fine medium and coarse roots; very strongly acid; clear wavy boundary.

C1g—10 to 23 inches; gray (10YR 6/1) loam; common medium distinct yellowish brown (10YR 5/6) mottles; massive; sticky; few medium roots; few brown stains around roots; very strongly acid; gradual wavy boundary.

C2g—23 to 34 inches; mottled gray (10YR 5/1), grayish brown (10YR 5/2), and dark yellowish brown (10YR 4/4) loamy sand; massive; loose; few brown stains

around old root channels; very strongly acid; gradual boundary.
C3g—34 to 50 inches; dark gray (5Y 4/1) sandy loam; common medium distinct yellowish brown (10YR 5/4) mottles; massive; slightly sticky; few brown stains around old root channels; very strongly acid; gradual wavy boundary.
C4g—50 to 62 inches; dark gray (5Y 4/1) loamy sand; massive; loose; very strongly acid.

Unless the surface layer has been limed, reaction is strongly acid or very strongly acid.

The A horizon has hue of 10YR, value of 2 through 4, and chroma of 1 through 3. Texture is loamy sand, sandy loam, or silt loam.

The C horizon has hue of 10YR through 5Y, value of 4 through 7, and chroma of 1 or 2. Texture is loam, fine sandy loam, sandy loam, or loamy sand. Mottles are in shades of yellow and brown.

Bodine series

The Bodine series consists of deep, somewhat excessively drained, moderately rapidly permeable soils that formed in residuum weathered from cherty limestone. These soils are on sharply dissected uplands. Slopes range from 6 to 30 percent.

Bodine soils are geographically associated with Allen and Decatur soils. Allen soils are on hillsides and have a fine-loamy control section. Decatur soils are on sloping uplands and have a clayey control section.

Typical pedon of Bodine cherty loam in an area of Allen-Bodine complex, 8 to 15 percent slopes; in a wooded area, 2,500 feet south and 2,340 feet west of the northeast corner of sec. 32, T. 20 S., R. 5 W:

A1—0 to 5 inches; very dark grayish brown (10YR 3/2) cherty loam; weak fine granular structure; very friable; many fine roots; about 20 percent by volume of chert fragments; neutral; gradual wavy boundary.
A2—5 to 15 inches; light yellowish brown (10YR 6/4) cherty loam; weak fine granular structure; very friable; many fine roots; about 20 percent by volume of chert fragments; slightly acid; gradual wavy boundary.
B1—15 to 21 inches; yellowish brown (10YR 5/6) cherty loam; weak fine subangular blocky structure; friable; few fine roots, about 35 percent by volume of chert fragments; strongly acid; gradual wavy boundary.
B21t—21 to 34 inches; yellowish red (5YR 4/8) very cherty clay loam; moderate medium subangular blocky structure; friable; patchy distinct clay films on faces of peds; 40 percent by volume of chert fragments as much as 2 inches in diameter; extremely acid; gradual wavy boundary.
B22t—34 to 53 inches; yellowish red (5YR 4/8) very cherty clay loam; few medium distinct reddish yellow (5YR 6/6) and yellowish red (5YR 5/8) mottles; weak medium subangular blocky structure; friable; continuous distinct clay films on faces of peds; 60 percent by volume of chert fragments mostly less than 6 inches in diameter; strongly acid; gradual wavy boundary.
B23t—53 to 62 inches; yellowish red (5YR 5/6) very cherty loam; few medium distinct reddish yellow (5YR 6/6) and yellowish red (5YR 4/8) mottles; weak medium subangular blocky structure; friable; patchy distinct clay films on faces of peds; 50 percent by volume of chert fragments ranging from 1/2 inch to 2 inches in diameter; extremely acid.

Solum thickness is more than 60 inches. Unless the surface layer has been limed, reaction ranges from strongly acid to extremely acid.

The A1 horizon has hue of 10YR, value of 3 through 5, and chroma of 2 or 3. The A2 horizon and Ap horizon if present, have hue of 10YR, value of 4 through 6, and chroma of 3 or 4. Texture of the fine earth fraction is sandy loam, silt loam, or loam. Content of chert fragments ranges from 20 to 40 percent by volume.

The B horizon has hue of 10YR, 7.5YR, or 5YR; value of 5 or 6; and chroma of 4 to 8; or hue of 5YR, value of 4, and chroma of 6 or 8. Texture of the fine earth fraction is silt loam, loam, or clay loam. Mottles are in shades of yellow, brown, and red. Content of chert fragments ranges from 35 to 60 percent or more.

Boswell series

The Boswell series consists of deep, moderately well drained, very slowly permeable soils that formed in fine textured marine sediments. These soils are on low ridges and toe slopes of the Coastal Plain uplands. Slopes range from 4 to 10 percent.

Boswell soils are geographically associated with Bama and Luverne soils. Bama soils have a fine-loamy control section and are generally at a higher elevation on the landscape. Luverne soils are on upper side slopes and narrow ridgetops and have less clay in the control section.

Typical pedon of Boswell loam, 4 to 10 percent slopes; in a stand of pine, 935 feet north and 750 feet east of the southwest corner of sec. 10, T. 22 S., R. 9 W:

Ap—0 to 4 inches; dark brown (10YR 4/3) loam; weak fine granular structure; friable; many fine and common roots; strongly acid; abrupt wavy boundary.
B21t—4 to 15 inches; red (10R 4/6) clay; moderate medium subangular blocky structure; firm; continuous distinct clay films on faces of peds; few vertical cracks approximately 1/2 inch in width; few slickensides; very strongly acid; abrupt wavy boundary.
B22t—15 to 26 inches; red (2.5YR 4/6) clay; common medium prominent light brownish gray (10YR 6/2)

mottles; moderate coarse subangular blocky structure; firm; continuous distinct clay films on faces of peds; few vertical cracks approximately 1/2 inch in width; common slickensides; very strongly acid; gradual wavy boundary.

B23t—26 to 34 inches; mottled red (2.5YR 4/6), light brownish gray (10YR 6/2), and grayish brown (10YR 5/2) clay; moderate coarse subangular blocky structure; firm; continuous distinct clay films on faces of peds; common slickensides; very strongly acid; clear wavy boundary.

B24tg—34 to 70 inches; mottled gray (10YR 6/1), light brownish gray (10YR 6/2), grayish brown (10YR 5/2), and red (2.5YR 4/6) clay; weak coarse subangular blocky structure; firm; discontinuous distinct clay films on faces of peds; common slickensides; very strongly acid; clear wavy boundary.

C—70 to 75 inches; mottled gray (N 5/0) and dark gray (N 4/0) clay; massive; very firm; common black and brown seams; common slickensides; very strongly acid.

Solum thickness is more than 60 inches. When these soils are dry, cracks of about 3/8 to 1 inch in width extend from the surface to a depth of about 20 to 30 inches. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid.

The A1 horizon, if present, has hue of 10YR, value of 3 through 5, and chroma of 2. The Ap or A2 horizon has hue of 10YR, value of 4 or 5, and chroma of 2 through 4. Texture is sandy loam or loam.

The B21t and B22t horizons have hue of 5YR, 2.5YR, or 10R; value of 4 or 5; and chroma of 4 through 8. Mottles are in shades of gray. Texture is silty clay or clay.

The B23t and B24t horizons are mottled in shades of gray, red, and brown. Gray is dominant in the B24t horizon. Texture is clay or silty clay.

The C horizon has colors similar to those in the lower part of the Bt horizon.

Brilliant series

The Brilliant series consists of deep, somewhat excessively drained, moderately rapidly permeable soils that formed in alkaline coal mine spoil areas. Slopes range from 6 to 45 percent.

Brilliant soils are geographically associated with Montevallo, Nauvoo, and Palmerdale soils. Montevallo soils are shallow over shale. Nauvoo soils have an argillic horizon over sandstone. Palmerdale soils formed from strip mine spoil and are acid throughout.

Typical pedon of Brilliant very shaly loam, 6 to 45 percent slopes; 2,000 feet north and 1,340 feet east of the southwest corner of sec. 29, T. 19 S., R. 7 W:

Ap—0 to 4 inches; grayish brown (2.5Y 5/2) very shaly loam; weak fine granular structure; friable; about 85 percent by volume of shale fragments; moderately alkaline; gradual wavy boundary.

C—4 to 70 inches; grayish brown (2.5Y 5/2) very shaly loam; massive; friable; about 80 percent by volume of coarse shale fragments; moderately alkaline.

Solum thickness ranges from 12 to 70 inches or more. Unless the surface layer has been limed, reaction ranges from moderately alkaline to medium acid. Fragments are mainly shale that contain a large amount of siderite nodules. The size of the fragments ranges from 1/8 inch to boulders of as much as 3 feet along their longest axis.

The Ap horizon has hue of 2.5Y, value of 5, and chroma of 2; or it has hue of 10YR, value of 5, and chroma of 4. The content of fragments is dominantly more than 80 percent. Most fragments are less than 1 inch in diameter. The fine earth fraction is silt loam or loam.

The C horizon has colors similar to those of the Ap horizon. Content of fragments is slightly less than the Ap horizon and ranges from 60 to 80 percent by volume. Texture of the fine earth fraction is silt loam or loam.

Cahaba series

The Cahaba series consists of deep, well drained, moderately permeable soils that formed in loamy and sandy alluvium. These soils are on broad stream terraces of the Coastal Plain and are rarely flooded. Slopes range from 0 to 4 percent.

Cahaba soils are geographically associated with Choccolocco, Ellisville, and Shatta soils. Choccolocco soils are on natural levees and have a fine-silty control section. Ellisville soils are on flood plains and do not have an argillic horizon. Shatta soils are at a slightly higher elevation on the landscape and have a fragipan.

Typical pedon of Cahaba sandy loam, in a cultivated field 2,000 feet north and 1,800 feet west of the southeast corner of sec. 7, T. 22 S., R. 10 W:

Ap—0 to 4 inches; dark yellowish brown (10YR 4/4) sandy loam; weak fine granular structure; friable; many fine and medium roots; slightly acid; gradual wavy boundary.

B21t—4 to 19 inches; yellowish red (5YR 5/8) clay loam; weak medium subangular blocky structure; friable; patchy distinct clay films on faces of some peds; very strongly acid; gradual wavy boundary.

B22t—19 to 37 inches; yellowish red (5YR 5/6) sandy clay loam; few fine faint yellowish brown (10YR 5/4) mottles; weak medium subangular blocky parting to weak fine granular structure; friable; patchy distinct clay films on faces of peds; few fine mica flakes; very strongly acid; abrupt smooth boundary.

C—37 to 63 inches; yellowish red (5YR 5/8) loamy sand; few fine prominent yellowish brown (10YR 5/4) and brownish yellow (10YR 6.6) mottles; structureless; few fine mica flakes; very strongly acid.

Solum thickness ranges from 36 to 55 inches. Unless the surface layer has been limed, reaction ranges from medium acid to very strongly acid. Mica flakes are in most pedons.

The A horizon has hue of 10YR, value of 4, and chroma of 3 or 4. Texture is sandy loam or fine sandy loam.

The B2t horizon has hue of 5YR and 2.5YR, value of 4 or 5, and chroma of 6 or 8. Texture is sandy clay loam or loam.

The C horizon has colors similar to those of the Bt horizon and has mottles of yellow and brown. In some pedons there are clean, loose sand grains. Texture is loamy sand or sandy loam.

Choccolocco series

The Choccolocco series consists of deep, well drained, moderately permeable soils that formed in medium textured fluvial sediments on natural levees of the Black Warrior River. Slopes range from 0 to 3 percent.

Choccolocco soils are geographically associated with Cahaba, Ellisville, and Shatta soils. Cahaba soils are on broad stream terraces and have a fine-loamy control section. Ellisville soils are on flood plains and do not have an argillic horizon. Shatta soils are at a slightly higher elevation on terraces and have a fragipan.

Typical pedon of Choccolocco silt loam, in a pasture of fescue, 1,990 feet north and 170 feet east of the southwest corner of sec. 4, T. 22 S., R. 11 W:

Ap—0 to 6 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; friable; many fine roots; few worm casts; slightly acid; abrupt smooth boundary.

B21t—6 to 23 inches; brown (7.5YR 4/4) silty clay loam; weak medium subangular blocky structure; friable; patchy distinct clay films on faces of peds; few fine pores; common fine roots, mostly between peds; few dark brown stains on ped faces; few fine mica flakes; medium acid; gradual wavy boundary.

B22t—23 to 38 inches; brown (7.5YR 4/4) silty clay loam; common medium distinct brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable; patchy distinct clay films on faces of peds; few fine pores; common fine roots, mostly between peds; few dark brown stains on ped faces; few fine mica flakes; medium acid; gradual wavy boundary.

B3—38 to 44 inches; brown (10YR 4/3) loam; common medium distinct yellowish brown (10YR 5/6) and very pale brown (10YR 7/3) mottles; weak fine to medium subangular blocky structure; friable; few dark stains on faces of peds; few fine mica flakes; very strongly acid; gradual wavy boundary.

C—44 to 72 inches; brown (10YR 4/3) loam; massive; very friable; very strongly acid.

Solum thickness ranges from 40 to 60 inches. Unless the surface has been limed, reaction ranges from medium acid to very strongly acid.

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

The B2t horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 or 4. The B3 horizon has hue of 10YR, value of 3 or 4, and chroma of 3 or 4. Texture is loam or silty clay loam.

The C horizon has colors similar to those of the B3 horizon and has mottles in shades of brown, yellow, and red. Texture is loam or sandy loam.

Decatur series

The Decatur series consists of deep, well drained, moderately permeable soils that formed in residuum from limestone. These soils are on broad ridgetops of the limestone valleys. Slopes range from 2 to 8 percent.

Decatur soils are in the same position on the landscape as Allen and Bodine soils. Allen soils are on lower side slopes and have a fine-loamy control section. Bodine soils are on adjacent side slopes and have a loamy-skeletal control section.

Typical pedon of Decatur loam in an area of Decatur loam, 2 to 8 percent slopes; in a wooded area 585 feet south and 335 feet west of the northeast corner of sec. 32, T. 20 S., R. 5 W:

Ap—0 to 4 inches; dark reddish brown (5YR 3/4) loam; moderate fine granular structure, very friable; common fine roots; medium acid; gradual wavy boundary.

B21t—4 to 30 inches; dark red (2.5YR 3/6) silty clay loam; moderate medium subangular blocky structure; friable; discontinuous distinct clay films on faces of peds; common fine roots; few chert fragments; strongly acid; gradual wavy boundary.

B22t—30 to 72 inches; dark red (2.5YR 3/6) silty clay loam; strong medium subangular blocky structure; friable; continuous distinct clay films on faces of peds; few chert fragments; strongly acid.

Solum thickness is 72 inches or more. Unless the surface layer has been limed, reaction ranges from medium acid to very strongly acid. There are a few chert fragments throughout the pedon.

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

The Bt horizon has hue of 2.5YR, value of 3, and chroma of 4 or 6. Texture is silty clay loam, silty clay, or clay. In some pedons there are mottles of yellowish brown. Content of chert fragments ranges from none to 5 percent by volume.

Dundee series

The Dundee series consists of deep, somewhat poorly drained, moderately slowly permeable soils that formed

in medium textured fluvial sediments. These soils are on low stream terraces and natural levees that border the Black Warrior River and some of its tributaries. These soils are rarely flooded. Slopes range from 0 to 2 percent.

Dundee soils are geographically associated with Adaton and Falkner soils. Adaton soils are in slightly lower positions on the landscape and have grayer colors throughout. Falkner soils are at a slightly higher elevation on the landscape and are better drained.

Typical pedon of Dundee silt loam in a cultivated field, 1,826 feet south and 1,586 feet east of the northwest corner of sec. 3, T. 22 S., R. 11 W:

Ap—0 to 3 inches; brown (10YR 4/3) silt loam; weak fine granular structure; very friable; many fine and medium roots; slightly acid; clear wavy boundary.

A12—3 to 13 inches; dark grayish brown (10YR 4/2) silt loam; few fine faint dark brown and pale brown mottles; weak medium granular structure; friable; common fine roots; slightly acid; abrupt smooth boundary.

B21t—13 to 24 inches; pale brown (10YR 6/3) silt loam; few fine faint yellowish brown mottles; few fine distinct coatings of light gray (10YR 7/1) on ped exteriors; weak medium subangular blocky structure; friable; patchy distinct clay films on faces of peds; common brown stains; strongly acid; gradual wavy boundary.

B22t—24 to 36 inches; pale brown (10YR 6/3) silt loam; common medium distinct yellowish brown (10YR 5/6) and brownish yellow (10YR 6/6) mottles; light gray (10YR 6/1) coatings on ped exteriors; weak fine subangular blocky structure; friable; patchy distinct clay films on faces of peds; slightly brittle and compact; few black concretions; very strongly acid; gradual wavy boundary.

B3g—36 to 58 inches; gray (10YR 6/1) silty clay loam; common medium distinct yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/4) mottles; coatings of light gray (10YR 7/1) on ped exteriors; weak fine subangular blocky structure; friable; patchy faint clay films on faces of some peds; many fine black concretions; very strongly acid; gradual wavy boundary.

Cg—58 to 72 inches; gray (10YR 6/1) silty clay loam; many medium distinct yellowish brown (10YR 5/8) mottles; massive; very firm; common black stains; very strongly acid.

Solum thickness ranges from 45 to 60 inches. Unless the surface layer has been limed, reaction ranges from medium acid to very strongly acid.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. Texture is silt loam or loam.

The Bt horizon has hue of 10YR, value of 5 through 7, and chroma of 3; or it has value of 5, chroma of 2, and ped coatings that have value of 6 and chroma of 1 or 2. Mottles are in shades of gray and brown. Texture is silt loam or silty clay loam.

The C horizon is mottled in shades of brown and gray. Texture is silt loam or silty clay loam.

Ellisville series

The Ellisville series consists of deep, well drained, moderately permeable soils that formed in medium to fine textured fluvial sediments. These soils are on flood plains and are frequently flooded. Slopes range from 0 to 2 percent.

Ellisville soils are geographically associated with Cahaba, Choccolocco, and Shatta soils. All associated soils are at a higher elevation on the landscape and have an argillic horizon. Shatta soils also have a fragipan.

Typical pedon of Ellisville silt loam, frequently flooded, in a pasture of fescue, 1,516 feet north and 830 feet west of the southeast corner of sec. 5, T. 22 S., R. 11 W:

Ap—0 to 3 inches; very dark grayish brown (10YR 3/2) silt loam; weak fine granular structure; friable; many fine roots; few fine pores; common wormcasts; few slightly acid; clear smooth boundary.

A12—3 to 9 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable; common fine roots; few fine pores; common worm casts; few very fine mica flakes; medium acid; clear smooth boundary.

A13—9 to 15 inches; dark brown (7.5YR 3/2) silty clay loam; weak fine subangular blocky structure; friable; common fine roots; common fine pores; few wormcasts; common fine mica flakes; medium acid; gradual wavy boundary.

B21—15 to 25 inches; dark brown (10YR 3/3) silty clay loam; weak medium subangular blocky structure; friable; few fine roots; common fine pores; few wormcasts; strongly acid; gradual wavy boundary.

B22—25 to 58 inches; brown (10YR 4/3) silty clay loam; few fine distinct strong brown (7.5YR 5/6) and few medium faint brown (10YR 5/3) mottles; weak fine to medium subangular blocky structure; friable; few fine roots; ped faces slightly darker than matrix color; few fine mica flakes; strongly acid; gradual wavy boundary.

C—58 to 68 inches; brown (10YR 4/3) silt loam; few fine faint brown (7.5YR 5/4) mottles; massive; friable; few fine pores; few fine roots; common fine mica flakes; very strongly acid.

Solum thickness is more than 45 inches. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid.

The A horizon has hue of 10YR, value of 4, and chroma of 2 through 4; or it has hue of 7.5YR, value of 5, and chroma of 4. In some pedons the A horizon is less than 7 inches thick and has hue of 10YR or 7.5YR, value of 3, and chroma of 2 or 3. Texture is silt loam or loam.

The B horizon has hue of 10YR, value of 3 or 4, and chroma of 3 or 4; or it has hue of 7.5YR, value of 4, and chroma of 4. Texture is silty clay loam or silt loam.

The C horizon has colors similar to those of the B horizon. Mottles are in shades of yellow and brown. Texture is silt loam, loam, or sandy loam.

Falkner series

The Falkner series consists of deep, moderately well drained, slowly permeable soils that formed in medium textured fluvial sediments. These soils are on stream terraces of the Coastal Plain. Slopes range from 0 to 2 percent.

Falkner soils are geographically associated with Adaton and Dundee soils. Adaton and Dundee soils are in lower positions on the landscape and are grayer throughout. Adaton soils are poorly drained, and Dundee soils are somewhat poorly drained.

Typical pedon of Falkner silt loam in a pasture, 1,500 feet south and 1,010 feet west of the northeast corner of sec. 23, T. 22 S., R. 11 W:

Ap—0 to 3 inches; dark brown (10YR 4/3) silt loam; weak fine granular structure; friable; many fine roots; strongly acid; clear wavy boundary.

A2—3 to 12 inches; yellowish brown (10YR 5/4) silt loam; few fine distinct pale brown (10YR 6/3) mottles; weak medium subangular blocky structure parting to weak fine granular; friable; few fine roots; strongly acid; clear wavy boundary.

B21t—12 to 18 inches; yellowish brown (10YR 5/6) silty clay loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure parting to weak fine granular; friable; few patchy distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

B22t—18 to 39 inches; yellowish brown (10YR 5/6) silty clay loam; common medium distinct light brownish gray (10YR 6/2) mottles; friable; broken distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

B23t—39 to 63 inches; mottled yellowish brown (10YR 5/4), dark yellowish brown (10YR 4/4), pale brown (10YR 6/3), and light brownish gray (10YR 6/2) silt loam; broken distinct clay films on faces of peds; common manganese concretions; strongly acid.

Solum thickness is more than 60 inches. Unless the surface layer has been limed, reaction ranges from medium acid to very strongly acid.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 through 4. Texture is silt loam, loam, or clay loam.

The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 3 through 6; or it is mottled in shades of brown and gray. Texture is silt loam or silty clay loam.

Flomaton series

The Flomaton series consists of deep, excessively drained, rapidly permeable soils that formed in thick deposits of sand and gravel. These soils are on narrow ridgetops and side slopes of the Coastal Plain uplands. Slopes range from 15 to 35 percent.

Flomaton soils are geographically associated with Montevallo, Nauvoo, Pikeville, and Smithdale soils. Montevallo and Nauvoo soils are on lower side slopes. Montevallo soils are underlain by shale at a depth of 20 inches, and Nauvoo soils have bedrock at a depth of 60 inches. Pikeville soils contain less than 35 percent gravel by volume in the control section, and Smithdale soils have less than 15 percent. Pikeville and Smithdale soils also have a fine-loamy control section.

Typical pedon of Flomaton very gravelly loamy sand in an area of Smithdale-Flomaton complex, 15 to 35 percent slopes; in a wooded area, 170 feet north and 2,070 feet east of the southwest corner of sec. 22, T. 20 S., R. 9 W:

A1—0 to 5 inches; dark brown (10YR 4/3) very gravelly loamy sand; weak fine granular structure; very friable; many fine and medium roots; about 40 percent quartz gravel by volume; strongly acid; clear wavy boundary.

A21—5 to 13 inches; brownish yellow (10YR 6/6) very gravelly loamy sand; common medium distinct dark grayish brown (10YR 4/2) mottles; single grained; loose; many medium roots; about 60 percent quartz gravel by volume; strongly acid; clear wavy boundary.

A22—13 to 27 inches; yellow (10YR 7/6) very gravelly loamy sand; single grained; loose; few fine roots; brown stains along old root channels; about 40 percent quartz gravel by volume; strongly acid; gradual wavy boundary.

A23&Bt—27 to 72 inches; yellow (10YR 8/6) gravelly loamy sand (A23 part); single grained, loose; lamellae of yellowish red (5YR 5/6) very gravelly sandy loam (Bt part), 2 to 3 1/2 inches thick and 1 inch to 1 1/2 inches apart; massive; friable; lamellae cover about 40 percent of the vertical area and are wavy and continuous; sand grains coated and bridged with clay; few fine roots; about 25 percent by volume quartz gravel in the matrix and 50 percent in the lamellae; very strongly acid.

Solum thickness is more than 60 inches. Unless the surface layer has been limed, reaction ranges from medium acid to very strongly acid. Content of gravel ranges from 25 to 70 percent by volume throughout the profile but is more than 35 percent in the control section.

The A1 horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. The A2 horizon has hue of 10YR, value of 6 through 8, and chroma of 6 or 8. Texture of the A horizon is gravelly or very gravelly loamy sand.

The A23&Bt horizon has hue of 10YR or 7.5YR, value of 6 to 8, and chroma of 6 or 8. The Bt part of the A23&Bt horizon has hue of 5YR, value of 5, and chroma of 6 or 8.

Iuka series

The Iuka series consists of deep, moderately well drained, moderately permeable soils that formed in stratified loamy and sandy sediments. These soils are on flood plains of streams in the upper part of the Coastal Plain. Iuka soils are frequently flooded and have scouring and uneven deposition of overwash. Slopes range from 0 to 2 percent.

Iuka soils are geographically associated with Bibb and Mantachie soils. Bibb soils are in a lower position on the landscape and are poorly drained. Mantachie soils are in slightly lower positions on the landscape and are somewhat poorly drained.

Typical pedon of Iuka silt loam from an area of Iuka-Mantachie complex, frequently flooded; in a wooded area, 1,840 feet south and 835 feet west of the northeast corner of sec. 1, T. 19 S., R. 11 W:

A11—0 to 4 inches; dark yellowish brown (10YR 4/4) silt loam; few fine faint yellowish brown mottles; weak fine subangular blocky structure; very friable; many fine and medium roots; many fine mica flakes; medium acid; gradual wavy boundary.

A12—4 to 10 inches; yellowish brown (10YR 5/4) loamy sand; single grained; very friable; many fine and medium roots; many mica flakes; strongly acid; gradual wavy boundary.

C1—10 to 13 inches; dark yellowish brown (10YR 4/4) silt loam; massive; friable; few medium roots; many fine mica flakes; strongly acid; clear wavy boundary.

C2g—13 to 18 inches; pale brown (10YR 6/3) loam; common medium distinct dark yellowish brown (10YR 4/4) mottles; massive; friable; few medium roots; many fine mica flakes; common black and brown stains along root channels; strongly acid; gradual wavy boundary.

C3g—18 to 72 inches; coarsely mottled grayish brown (10YR 5/2), light brownish gray (10YR 6/2), light olive brown (2.5Y 5/4), and dark yellowish brown (10YR 4/4) loamy sand; lenses and strata of sandy loam; massive; friable; black and brown stains along root channels; few fine mica flakes; medium acid.

Unless the surface layer has been limed, reaction is strongly acid or very strongly acid. Thin bedding planes and contrasting textures are common.

The A horizon has hue of 10YR or 7.5YR, value of 4 through 6, and chroma of 3 or 4. Texture is silt loam, loam, loamy sand, or sandy loam.

The C1 horizon has hue of 10YR or 7.5YR, value of 4 through 6, and chroma of 3 or 4; or it has value of 4 and chroma of 2. Texture is sandy loam, silt loam, or loam.

The C2g and C3g horizons have hue of 10YR or 7.5YR, value 4 through 6, and chroma of 3 or 4; or they are mottled in shades of gray, brown, and yellow. Texture is loamy sand, sandy loam, or loam.

Luverne series

The Luverne series consists of deep, well drained, moderately slowly permeable soils that formed in stratified marine deposits. These soils are on ridges and side slopes of dissected Coastal Plain uplands. Slopes range from 4 to 35 percent.

Luverne soils are geographically associated with Bama, Boswell, Ruston, and Smithdale soils. Bama soils are on ridgetops and have a fine-loamy control section. Boswell soils are on lower slopes and have a more clayey control section. Ruston and Smithdale soils are in the same position on the landscape and have a fine-loamy control section. Ruston soils also have a bisequal solum.

Typical pedon of Luverne fine sandy loam in an area of Luverne-Smithdale complex, 4 to 10 percent slopes; in a wooded area, 835 feet north and 2,608 feet west of the southeast corner of sec. 11, T. 22 S., R. 9 W:

Ap—0 to 4 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak fine granular structure; friable; many fine and common roots; very strongly acid; clear wavy boundary.

B21t—4 to 14 inches; dark red (2.5YR 3/6) clay; moderate medium subangular blocky structure; friable; continuous distinct clay films on faces of peds; extremely acid; gradual wavy boundary.

B22t—14 to 24 inches; dark red (2.5YR 3/6) sandy clay; common medium prominent light yellowish brown (10YR 6/4) mottles; weak medium subangular blocky structure; friable; continuous distinct clay films on faces of peds; fine mica flakes; extremely acid; gradual wavy boundary.

B23t—24 to 39 inches; dark red (2.5YR 3/6) clay; weak fine subangular blocky structure; friable; patchy distinct clay films on faces of peds; common thin discontinuous bands of gray (N 6/0) soft shaly material in the lower part; extremely acid; gradual wavy boundary.

C1—39 to 50 inches; yellowish red (5YR 4/6), stratified, thinly bedded loamy sand and clay; structureless; firm; common fine mica flakes; extremely acid; gradual wavy boundary.

C2—50 to 80 inches; yellowish red (5YR 4/6) stratified sand and clay with 5- to 10-inch layers of sand and 2-inch layer of clay; structureless; firm; extremely acid.

Solum thickness ranges from 30 to 50 inches. Unless the surface layer has been limed, reaction ranges from strongly acid to extremely acid.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is fine sandy loam or sandy loam. Mica flakes are common throughout.

The Bt horizon has hue of 5YR or 2.5YR, value of 3 through 5, and chroma of 6 or 8. Texture is clay, sandy clay, or clay loam. Mottles in the lower part of the Bt horizon are in shades of olive, brown, and red.

The C horizon is mottled in shades of yellow, red, and gray and has thin bands or layers of red sandy material and gray clayey, soft shale strata.

Mantachie series

The Mantachie series consists of deep, somewhat poorly drained, moderately permeable soils that formed in thinly stratified, loamy alluvial sediments. These soils are on flood plains of streams in the Coastal Plain. These soils are flooded frequently and are subject to scouring and uneven deposition of overwash. They are saturated with water to a depth of 20 inches late in winter and spring. Slopes range from 0 to 2 percent.

Mantachie soils are geographically associated with Amy, Augusta, Bibb, and Iuka soils. Amy and Augusta soils are on adjacent larger flood plains of the Sipsey River. Bibb soils are in a lower position on the landscape and are poorly drained. Iuka soils are at a slightly higher elevation and are moderately well drained. In addition, Bibb and Iuka soils have a coarse-loamy control section.

Typical pedon of Mantachie loam in an area of Iuka-Mantachie complex, frequently flooded; in a pasture, 585 feet south and 335 feet west of the northeast corner of sec. 23, T. 18 S., R. 11 W:

Ap—0 to 6 inches; brown (10YR 5/3) loam; weak medium subangular blocky structure; very friable; many fine roots; few brown stains on root channels; medium acid; gradual wavy boundary.

B1—6 to 18 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct light gray (10YR 6/1) mottles; weak medium subangular blocky structure; friable; many fine and medium roots; few brown stains along root channels; strongly acid; gradual wavy boundary.

B21g—18 to 26 inches; mottled grayish brown (10YR 5/2), light brownish gray (10YR 6/2), and light yellowish brown (10YR 6/4) loam; weak medium subangular blocky structure; friable; slightly sticky; few fine roots; few brown stains; strongly acid; gradual wavy boundary.

B22g—26 to 45 inches; light brownish gray (10YR 6/2) loam; common medium distinct yellowish brown (10YR 5/4), very pale brown (10YR 7/3), and light yellowish brown (10YR 6/4) mottles; weak medium subangular blocky structure; friable; slightly sticky; few brown stains; very strongly acid; gradual wavy boundary.

B23g—45 to 55 inches; gray (10YR 5/1) sandy clay loam; common medium distinct grayish brown (10YR 5/2) and yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; slightly sticky; very strongly acid; gradual wavy boundary.

Clg—55 to 60 inches; light brownish gray (10YR 6/2) loamy sand; common medium distinct yellowish brown (10YR 5/6) mottles; massive; single grained; very friable; very strongly acid.

Solum thickness ranges from 40 to 60 inches. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 through 4. Mottles are in shades of brown, yellow, and gray. Texture is loam or sandy loam.

The upper part of the B horizon has hue of 10YR, value of 5 and 6, and chroma of 2 or 4. Mottles are in shades of yellow, gray, and brown. The lower part of the B horizon has hue of 10YR, value of 5 through 7, and chroma of 1 or 2. Texture is sandy loam, sandy clay loam, or loam. Mottles are in shades of gray, yellow, and brown.

The C horizon, if present, is similar in color and texture to the B horizon.

Montevallo series

The Montevallo series consists of shallow, well drained, moderately permeable soils that formed in residuum from siltstone and silty shale containing a few strata of interbedded sandstone. These soils are on side slopes and narrow ridgetops. Slopes range from 10 to 45 percent.

Montevallo soils are geographically associated with Brilliant, Flomaton, Nauvoo, Pikeville, and Palmerdale soils. All of the associated soils have a thicker solum. Brilliant and Palmerdale soils formed from strip mine spoils. Flomaton soils contain more than 35 percent gravel in the control section and are excessively drained. Nauvoo and Pikeville soils have an argillic horizon and a fine-loamy control section.

Typical pedon of Montevallo shaly loam in an area of Montevallo-Nauvoo association, steep; 1,420 feet north and 1,420 feet west of the southeast corner of sec. 20, T. 20 S., R. 6 W:

A11—0 to 2 inches; dark grayish brown (10YR 4/2) shaly loam; weak fine granular structure; friable; 15 percent by volume shale fragments; very strongly acid; clear wavy boundary.

A12—2 to 7 inches; light yellowish brown (10YR 6/4) shaly silt loam; weak fine granular structure; friable; 20 percent by volume shale fragments; very strongly acid; gradual wavy boundary.

B—7 to 12 inches; light yellowish brown (10YR 6/4) very shaly silt loam; weak medium subangular blocky structure; friable; 60 percent by volume shale fragments; very strongly acid; gradual wavy boundary.

Cr—12 to 20 inches; soft, rippable shale with yellowish brown (10YR 5/4) silt loam material interbedded between cleavage planes.

Solum thickness ranges from 10 to 20 inches. Reaction ranges from medium acid to very strongly acid.

The A horizon has hue of 10YR, value of 3 through 5, and chroma of 2 through 4; or it has value of 6 and chroma of 4. Texture is shaly loam or shaly silt loam. The content of shale fragments is 15 to 35 percent by volume

The B horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 through 6; or it has hue of 5YR, value of 5 or 6, and chroma of 6. Content of shale fragments is as much as 85 percent by volume in some profiles. Texture is very shaly loam, very shaly silt loam, or shaly silty clay loam.

The Cr horizon is soft, rippable silty shale or siltstone.

Nauvoo series

The Nauvoo series consists of deep, well drained, moderately permeable soils that formed in loamy residuum weathered from sandstone or interbedded sandstone, siltstone, and shale. Slopes range from 4 to 30 percent.

Nauvoo soils are geographically associated with Brilliant, Montevallo, Palmerdale, and Pikeville soils. Brilliant and Palmerdale soils formed in strip mine spoils. Flomaton and Pikeville soils have a solum that is more than 60 inches thick. In addition, Flomaton soils have a sandy-skeletal control section. Montevallo soils have a solum that is less than 20 inches thick and do not have an argillic horizon.

Typical pedon of Nauvoo fine sandy loam, 4 to 10 percent slopes; in a wooded area, 1,667 feet south and 1,336 feet west of the northeast corner of sec. 20, T. 20 S., R. 6 W:

A1—0 to 6 inches; brown (10YR 4/3) fine sandy loam; weak fine granular structure; very friable; strongly acid; clear wavy boundary.

A2—6 to 17 inches; yellowish brown (10YR 5/6) fine sandy loam; weak fine granular structure; very friable; few sandstone fragments; strongly acid; clear wavy boundary.

B21t—17 to 30 inches; yellowish red (5YR 4/8) clay loam; moderate medium subangular blocky structure; friable; patchy distinct clay films on faces of peds; about 5 percent by volume sandstone; strongly acid; gradual wavy boundary.

B22t—30 to 35 inches; yellowish red (5YR 4/8) clay loam; common medium distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; friable; patchy distinct clay films on faces of peds; about 5 percent by volume sandstone fragments; very strongly acid; gradual wavy boundary.

B3—35 to 41 inches; mottled yellowish red (5YR 5/8), yellowish brown (10YR 5/8), and pale brown (10YR 6/3) sandy clay loam; weak medium subangular blocky structure; very friable; about 15 percent by volume sandstone fragments; very strongly acid; gradual wavy boundary.

Cr—41 to 60 inches; mottled yellowish red (5YR 5/8), brownish yellow (10YR 6/8), and light brownish gray (10YR 6/2) highly weathered soft shale and sandstone.

Solum thickness ranges from 30 to 50 inches. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid. Weathered sandstone fragments are present in most pedons.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 3 through 6. Texture is fine sandy loam or loam.

The B2t horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 4 through 8. Texture is clay loam, sandy clay loam, or loam. Mottles are in shades of yellow, brown, or red in the lower part of the Bt horizon.

The B3 horizon has colors similar to those of the B2t horizon. Mottles are in shades of yellow and brown throughout. Texture is sandy clay loam or sandy loam.

The Cr horizon consists of level bedded, soft sandstone or interbedded sandstone and shale in shades of red, yellow, and gray. It is rippable and can be cut with handtools in most places.

Palmerdale series

The Palmerdale series consists of deep, somewhat excessively drained, moderately rapidly permeable soils that formed in coal strip mine spoils. Slopes range from 6 to 45 percent.

Palmerdale soils are geographically associated with Brilliant, Montevallo, Nauvoo, and Smithdale soils. Brilliant soils are the only associated soils that formed from strip mine spoil. Brilliant soils are in similar positions on the landscape and are more alkaline throughout.

Typical pedon of Palmerdale very shaly loam, 6 to 45 percent slopes; in a barren area, 170 feet north and 900 feet east of the southwest corner of sec. 35, T. 20 S., R. 8 W:

Ap—0 to 5 inches; grayish brown (2.5Y 5/2) very shaly loam; weak medium granular structure; friable; about 60 percent by volume shale fragments; strongly acid; gradual wavy boundary.

C—5 to 80 inches; grayish brown (2.5Y 5/2) very shaly sandy loam; massive; friable; about 75 percent by volume shale fragments; extremely acid.

Solum thickness is more than 60 inches. Unless the surface layer has been limed, reaction ranges from strongly acid to extremely acid.

The A horizon ranges from grayish brown to yellowish red. Texture is shaly to very shaly loam or silt loam; or it

is gravelly to very gravelly sandy loam. Content of fragments ranges from 40 to 80 percent by volume.

The C horizon has colors similar to those of the A horizon, with more shades of yellow and brown. Texture is very shaly silt loam or very shaly loam. Content of fragments ranges from 60 to 90 percent by volume.

Pikeville series

The Pikeville series consists of deep, well drained, moderately permeable soils that formed in gravelly and loamy marine sediments. These soils are on hilltops and narrow ridgetops of Coastal Plain uplands. Slopes range from 10 to 35 percent.

Pikeville soils are geographically associated with Flomaton, Montevallo, Nauvoo, and Smithdale soils. Flomaton soils are in the same position on the landscape and have a sandy-skeletal control section. Montevallo and Nauvoo soils are on lower side slopes and have a thinner solum. Smithdale soils are on ridges and side slopes and have less than 15 percent gravel by volume in the lower part of the solum.

Typical pedon of Pikeville sandy loam in an area of Smithdale-Pikeville association, hilly; in a wooded area, 20 feet south and 1,336 feet east of the northwest corner of sec. 23, T. 19 S., R. 8 W:

A1—0 to 7 inches; dark grayish brown (10YR 4/2) sandy loam; weak fine granular structure; very friable; many fine roots; strongly acid; clear wavy boundary.

A2—7 to 13 inches; yellowish brown (10YR 5/4) sandy loam; common medium distinct dark grayish brown (10YR 4/2) mottles; weak fine granular structure; very friable; many fine and medium roots; about 5 percent by volume gravel; strongly acid; gradual wavy boundary.

B1—13 to 16 inches; yellowish red (5YR 4/8) sandy loam; common medium distinct yellowish brown (10YR 5/4) mottles; weak fine subangular blocky structure; friable; many fine roots; about 5 percent by volume gravel; strongly acid; gradual wavy boundary.

B21t—16 to 25 inches; yellowish red (5YR 4/6) sandy clay loam; weak medium subangular blocky structure; friable; few fine roots; few patchy distinct clay films on faces of peds and on gravel; about 5 percent by volume gravel; very strongly acid; gradual wavy boundary.

B22t—25 to 31 inches; red (2.5YR 4/8) gravelly sandy clay loam; few fine distinct reddish yellow (5YR 6/6) mottles; weak fine subangular blocky structure; friable; patchy distinct clay films on faces of peds and on gravel; about 25 percent by volume gravel; strongly acid; gradual wavy boundary.

B23t—31 to 52 inches; yellowish red (5YR 4/8) very gravelly sandy clay loam; few fine faint reddish yellow mottles; weak fine subangular blocky structure; friable; patchy distinct clay films on faces of some peds and on gravel; 70 percent by volume gravel; very strongly acid; gradual boundary.

B24t—52 to 72 inches; yellowish red (5YR 5/8) very gravelly sandy clay loam; few fine faint reddish yellow mottles; weak fine granular structure; friable; patchy distinct clay films on faces of some peds and on gravel; about 70 percent by volume gravel; very strongly acid.

Solum thickness is more than 72 inches. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid.

The Ap or A1 horizon has hue of 10YR, value of 3 or 4, and chroma of 1 through 4. The A2 horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Texture of the A horizon is sandy loam, fine sandy loam, or loam.

The B1 horizon, if present, has hue of 5YR, value of 4 or 5, and chroma of 6 or 8. Texture is sandy loam or loam.

The Bt horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8. Mottles in shades of yellow and brown are in the lower part of some pedons. Texture of the fine earth fraction is sandy clay loam, sandy loam, or clay loam. Content of gravel ranges from 5 to 25 percent by volume in the upper part and from 30 to 80 percent in the lower part.

Ruston series

The Ruston series consists of deep, well drained, moderately permeable soils that formed in thick beds of marine sediments. These soils are on side slopes and broad ridgetops of uplands. Slopes range from 0 to 6 percent.

Ruston soils are geographically associated with Bama, Luverne, and Smithdale soils. These associated soils are in similar positions on the landscape and do not have a bisequal pedon. In addition, Smithdale soils have a decrease in clay content with depth.

Typical pedon of Ruston fine sandy loam, 2 to 6 percent slopes; in a pasture, 500 feet south and 830 feet east of the northwest corner of sec. 30, T. 20 S., R. 9 W:

Ap—0 to 3 inches; dark brown (10YR 4/3) fine sandy loam; weak medium granular structure; very friable; many fine roots; medium acid; abrupt smooth boundary.

A2—3 to 8 inches; yellowish brown (10YR 5/4) fine sandy loam; common medium distinct reddish yellow (7.5YR 6/6) mottles; weak medium subangular blocky structure; friable; common fine roots; few fine pores; about 5 percent by volume quartz gravel; sand grains bridged with clay; medium acid; clear wavy boundary.

B21t—8 to 12 inches; yellowish red (5YR 4/6) loam; weak medium subangular blocky structure; friable; patchy distinct clay films on faces of peds; common fine roots; common fine pores; about 5 percent by

volume quartz gravel; medium acid; clear wavy boundary.

B22t—12 to 26 inches; yellowish red (5YR 4/6) loam; moderate medium and coarse subangular blocky structure; friable; discontinuous distinct clay films on faces of peds; few fine pores; few fine roots; about 5 percent by volume quartz gravel; medium acid; clear wavy boundary.

B&A'2—26 to 33 inches; yellowish red (5YR 4/8) loam; common medium faint red and reddish yellow, and common medium prominent strong brown (7.5YR 5/6) mottles; pockets of pale brown (10YR 6/3) fine sandy loam in approximately 50 percent of the horizon; moderate medium to coarse angular blocky to subangular blocky structure; firm and brittle; patchy distinct clay films on faces of some peds; few fine roots along cleavage planes of peds; common fine pores; about 5 percent by volume quartz gravel; medium acid; clear wavy boundary.

B'21t—33 to 51 inches; yellowish red (5YR 4/8) loam; common medium distinct strong brown (7.5YR 5/6) and common medium to coarse faint red and pale brown mottles; moderate medium to coarse subangular blocky structure; firm and brittle; patchy distinct clay films on faces of peds; common fine and medium pores; few pockets of uncoated sand grains; about 5 percent by volume quartz gravel; very strongly acid; clear wavy boundary.

B'22t—51 to 61 inches; yellowish red (5YR 4/8) sandy clay loam; common medium to coarse prominent very pale brown (10YR 7/4) and many coarse faint red mottles; moderate medium to coarse subangular blocky structure; firm and brittle; patchy distinct clay films on faces of peds; common medium pores; about 5 percent by volume quartz gravel; very strongly acid; gradual wavy boundary.

B'23t—61 to 81 inches; mottled yellowish red (5YR 4/8), red (2.5YR 4/6), and reddish yellow (5YR 6/6) loam; many medium prominent brownish yellow (10YR 6/8) mottles; moderate medium subangular blocky structure; firm and brittle; patchy distinct clay films on faces of peds; common medium pores; about 5 percent by volume quartz gravel; very strongly acid.

Solum thickness is more than 72 inches. Unless the surface layer has been limed, reaction of the A horizon ranges from slightly acid to strongly acid. Reaction of the B horizon ranges from medium acid to very strongly acid. Quartz gravel content throughout the solum is less than 15 percent by volume.

The A horizon has hue of 10YR, value of 4 through 6, and chroma of 3 or 4. Texture is fine sandy loam or sandy loam.

The Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 or 8. The B't horizon has hue of 5YR, value of 4 through 6, and chroma of 6 or 8; or it has hue of 2.5YR, value of 4, and chroma of 6 or 8. Mottles are in shades of red, yellow, brown, or gray. Texture of the B horizon is fine sandy loam, loam, or sandy clay loam.

The A'2 horizon has hue of 10YR, value of 6, and chroma of 3 or 4; or it has value of 5 and chroma of 3. Texture is fine sandy loam or sandy loam.

Shatta series

The Shatta series consists of deep, moderately well drained, moderately permeable soils that formed in thick beds of loamy marine sediments. Slopes range from 0 to 6 percent.

Shatta soils are geographically associated with Cahaba, Choccolocco, and Ellisville soils. None of the associated soils have a fragipan. Cahaba soils have a red subsoil and are well drained. Choccolocco soils are on natural levees and have a solum that is less than 60 inches. Ellisville soils are on flood plains and do not have an argillic horizon.

Typical pedon of Shatta silt loam, 0 to 2 percent slopes; in a stand of pines, 1,085 feet south and 200 feet east of the northwest corner of sec. 31, T. 21 S., R. 10 W:

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; very friable; common fine and medium roots; strongly acid; abrupt smooth boundary.

A2—7 to 13 inches; yellowish brown (10YR 5/4) silt loam; weak fine granular structure; friable; common fine roots; very strongly acid; clear wavy boundary.

B2t—13 to 21 inches; yellowish brown (10YR 5/4) silt loam; moderate fine subangular blocky structure; friable; discontinuous distinct clay films on faces of peds; few fine roots; very strongly acid; abrupt wavy boundary.

Bx1—21 to 28 inches; yellowish brown (10YR 5/6) silt loam; common medium distinct pale brown (10YR 6/3) and light brownish gray (10YR 6/2) mottles; weak coarse platy structure parting to moderate medium subangular blocky; very firm, compact and brittle; patchy distinct clay films on faces of peds; sand grains coated and bridged with clay; about 65 percent brittleness by volume; common fine to medium pores; very strongly acid; abrupt wavy boundary.

Bx2—28 to 45 inches; yellowish brown (10YR 5/6) clay loam; common medium distinct pale brown (10YR 6/3) and light brownish gray (10YR 6/2) mottles; weak coarse platy structure parting to moderate medium subangular blocky; very firm, compact and brittle; patchy distinct clay films on faces of peds; sand grains coated and bridged with clay; about 65 percent brittleness by volume; common fine and medium pores; very strongly acid; abrupt wavy boundary.

Bx3—45 to 60 inches; strong brown (7.5YR 5/6) clay loam; moderate medium distinct dark yellowish

brown (10YR 4/4) and yellowish brown (10YR 5/6) mottles; weak coarse platy structure parting to moderate medium subangular blocky; firm; patchy distinct clay films on faces of peds; about 60 percent brittleness by volume; common fine and medium pores; very strongly acid.

Solum thickness is more than 60 inches. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 through 4. Texture is silt loam, loam, or very fine sandy loam.

The B2t horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 4 through 8. Texture is silt loam or silty clay loam.

The Bx horizon has colors similar to those of the B2t horizon. Mottles are in shades of yellow, brown, and gray. Texture of the Bx horizon is silt loam, loam, clay loam, or silty clay loam. Brittleness is more than 60 percent by volume.

Smithdale series

The Smithdale series consists of deep, well drained, moderately permeable soils that formed in thick beds of loamy marine sediments of Coastal Plain uplands. These soils are on hilly landscapes and are dominantly on narrow ridgetops and steep side slopes. Slopes range from 6 to 35 percent.

Smithdale soils are geographically associated with Bama, Flomaton, Luverne, Palmerdale, Pikeville, and Ruston soils. Bama soils are on broad ridgetops and plateaus and have slopes of less than 6 percent. Luverne soils are on lower convex knolls and side slopes in the same position on the landscape as the Smithdale soils and have a clayey control section. Flomaton and Pikeville soils are on lower side slopes and contain more than 15 percent gravel in some parts of the profile. Flomaton soils contain more than 35 percent gravel and are excessively drained. Palmerdale soils formed in strip mine spoil. Ruston soils are on a less sloping, similar position on the landscape and have a bisequal pedon.

Typical pedon of Smithdale fine sandy loam, 6 to 15 percent slopes; in a field planted to pines 2,000 feet north and 1,840 feet east of the southwest corner of sec. 17, T. 20 S., R. 9 W:

Ap—0 to 5 inches; dark brown (10YR 4/3) fine sandy loam; weak fine granular structure; very friable; many fine to medium roots; strongly acid; clear wavy boundary.

B21t—5 to 20 inches; red (2.5YR 4/6) loam; moderate medium subangular blocky structure; friable; patchy distinct clay films on faces of peds; few fine and medium roots; very strongly acid; gradual wavy boundary.

B22t—20 to 42 inches; red (2.5YR 4/8) loam; weak medium subangular blocky structure; friable; discontinuous distinct clay films on faces of peds; few fine roots; very strongly acid; gradual wavy boundary.

B23t—42 to 52 inches; yellowish red (5YR 4/6) sandy loam; weak medium subangular blocky structure; friable; patchy distinct clay films on faces of some peds; few pockets of uncoated sand grains; very strongly acid; gradual wavy boundary.

B24t—52 to 72 inches; yellowish red (5YR 4/6) sandy clay loam; weak fine subangular blocky structure; friable; few patchy distinct clay films on faces of some peds; few pockets of uncoated sand grains; very strongly acid.

Solum thickness ranges from 60 to 72 inches. Unless the surface layer has been limed, reaction is strongly acid or very strongly acid.

The A horizon has hue of 10YR, value of 3 through 5, and chroma of 2 or 3; or it has value of 5 and chroma of 4. Texture is fine sandy loam, sandy loam, or loam. Gravel content is generally less than 5 percent by volume.

The Bt horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8. Texture of the upper part of the Bt horizon is loam, sandy clay loam, or clay loam. The lower part of the Bt horizon is sandy clay loam or sandy loam. Few to many pockets of uncoated sand grains are in the lower part of the Bt horizon. Gravel content is generally less than 5 percent but ranges to as much as 10 percent by volume.

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glossary

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.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15.2 to 38.1 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 slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Compressible (in tables). Excessive decrease in volume of soft soil 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.

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.

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, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fine textured soil. Sandy clay, silty clay, and clay.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Forest land. Land that has at least a 25 percent canopy cover, or land that is at least 10 percent stocked by forest trees of any size, including land that formerly had such cover and that will be naturally or artificially reforested.

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.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

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.

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.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these. 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 Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

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 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.

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.

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).

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

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 affecting 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 downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.20 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.)

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.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. 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 outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The 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

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. 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). 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.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon.

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 runoff water.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

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.

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.

Slow intake (in tables). The slow movement of water into 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 mm 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 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 which 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).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter 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."

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial melt water. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1951-73 at Tuscaloosa, Ala.]

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average daily	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days[1]	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January	54.9	33.5	44.2	76	11	43	4.96	3.05	6.67	7	.2
February	59.3	36.1	47.7	79	15	102	4.72	2.41	6.60	7	.5
March	66.5	42.3	54.4	84	23	200	5.26	3.31	7.01	8	.0
April	76.7	51.6	64.2	90	32	426	4.94	2.92	6.74	7	.0
May	83.8	59.1	71.5	95	40	667	3.53	1.62	5.08	6	.0
June	90.0	67.0	78.5	102	52	855	3.45	1.78	4.81	5	.0
July	91.7	70.2	81.0	101	59	961	4.95	2.33	7.08	7	.0
August	91.7	69.4	80.6	101	58	949	3.30	1.43	4.82	5	.0
September	87.1	63.8	75.5	98	45	765	2.87	1.18	4.26	5	.0
October	77.5	50.7	64.1	92	29	437	2.71	.78	4.24	4	.0
November	65.3	39.9	52.6	83	20	123	3.30	2.16	4.33	6	.0
December	57.5	35.6	46.6	78	13	91	5.27	2.80	7.28	8	.1
Yearly:											
Average	75.2	51.6	63.4	---	---	---	---	---	---	---	---
Extreme	---	---	---	103	9	---	---	---	---	---	---
Total	---	---	---	---	---	5,619	49.26	42.78	55.52	75	.8

[1]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 2.--FREEZE DATES IN SPRING AND FALL

[Recorded in the period 1951-73 at Tuscaloosa, Ala.]

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 16	March 31	April 11
2 years in 10 later than--	March 7	March 24	April 6
5 years in 10 later than--	February 17	March 12	March 27
First freezing temperature in fall:			
1 year in 10 earlier than--	November 8	October 24	October 22
2 years in 10 earlier than--	November 16	October 30	October 26
5 years in 10 earlier than--	November 30	November 11	November 2

TABLE 3.--GROWING SEASON

[Recorded in the period 1951-73 at Tuscaloosa, Ala.]

Probability	Daily minimum temperature during growing season		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	250	217	200
8 years in 10	262	226	206
5 years in 10	286	244	219
2 years in 10	310	262	231
1 year in 10	322	271	238

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
2	Adaton silt loam	21,062	2.4
3	Allen-Bodine complex, 8 to 15 percent slopes	4,947	0.6
4	Augusta-Amy complex, frequently flooded	28,561	3.3
5	Bama fine sandy loam, 0 to 2 percent slopes	2,867	0.3
6	Bama fine sandy loam, 2 to 6 percent slopes	28,575	3.3
7	Bama-Urban land complex, 0 to 2 percent slopes	1,063	0.1
8	Bama-Urban land complex, 2 to 6 percent slopes	6,577	0.8
9	Bibb soils, frequently flooded	6,386	0.7
10	Bodine-Allen association, hilly	4,430	0.5
11	Boswell loam, 4 to 10 percent slopes	6,246	0.7
12	Brilliant very shaly loam, 6 to 45 percent slopes	1,476	0.2
13	Cahaba sandy loam	4,301	0.5
14	Choccolocco silt loam	7,622	0.9
15	Decatur loam, 2 to 8 percent slopes	2,286	0.3
16	Dundee silt loam	8,398	1.0
17	Ellisville silt loam, frequently flooded	10,732	1.2
18	Falkner silt loam	7,276	0.8
19	Iuka-Mantachie complex, frequently flooded	36,816	4.3
20	Luverne-Smithdale complex, 4 to 10 percent slopes	39,914	4.6
21	Montevallo-Nauvoo complex, 15 to 45 percent slopes	30,997	3.6
22	Montevallo-Nauvoo association, steep	168,691	19.5
23	Nauvoo fine sandy loam, 4 to 10 percent slopes	28,730	3.4
24	Palmerdale very gravelly loam, 6 to 45 percent slopes	3,105	0.4
25	Palmerdale very shaly loam, 6 to 45 percent slopes	16,560	1.9
26	Pits	1,411	0.2
27	Ruston fine sandy loam, 0 to 2 percent slopes	532	0.1
28	Ruston fine sandy loam, 2 to 6 percent slopes	15,049	1.7
29	Shatta silt loam, 0 to 2 percent slopes	4,560	0.5
30	Shatta silt loam, 2 to 6 percent slopes	9,139	1.1
31	Shatta-Urban land complex, 0 to 2 percent slopes	597	0.1
32	Shatta-Urban land complex, 2 to 6 percent slopes	945	0.1
33	Smithdale fine sandy loam, 6 to 15 percent slopes	45,254	5.2
34	Smithdale fine sandy loam, 15 to 35 percent slopes	16,612	1.9
35	Smithdale-Flomaton complex, 15 to 35 percent slopes	26,702	3.1
36	Smithdale-Luverne complex, 15 to 35 percent slopes	46,989	5.4
37	Smithdale-Urban land complex, 6 to 15 percent slopes	1,610	0.2
38	Smithdale association, hilly	46,220	5.4
39	Smithdale-Luverne association, hilly	120,224	13.9
40	Smithdale-Pikeville association, hilly	38,508	4.5
41	Urban land	1,090	0.1
	Water	10,300	1.2
	Total	863,360	100.0

TABLE 5.--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	Corn	Soybeans	Cotton lint	Wheat	Improved bermudagrass	Tall fescue	Bahiagrass
	Bu	Bu	Lb	Bu	AUM*	AUM*	AUM*
2---- Adaton	70	30	550	---	8.0	9.0	8.0
3---- Allen-Bodine	---	---	---	---	5.0	5.0	5.0
4---- Augusta-Amy	---	---	---	---	6.0	7.0	6.0
5---- Bama	90	35	800	40	10.0	8.0	10.0
6---- Bama	85	35	750	35	9.5	8.0	9.5
7---- Bama-Urban land	---	---	---	---	---	---	---
8---- Bama-Urban land	---	---	---	---	---	---	---
9---- Bibb	---	---	---	---	4.0	8	---
10**:							
Bodine----	---	---	---	---	5.0	4.0	4.0
Allen----	---	---	---	---	6.0	6.5	6.0
11---- Boswell	---	---	---	---	4.5	5.0	6.0
12---- Brilliant	---	---	---	---	---	---	---
13---- Cahaba	110	40	900	40	9.5	8.0	8.0
14---- Choccolocco	95	35	850	40	8.0	9	8.0
15---- Decatur	80	30	900	45	7.5	7.5	7.5
16---- Dundee	85	40	750	40	9.0	9.0	8.5
17---- Ellisville	100	40	750	40	8.5	8.0	8.5
18---- Falkner	75	35	625	---	8.5	8.0	8.0
19---- Iuka-Mantachie	---	25	---	---	7.5	7.4	7.4
20---- Luverne-Smithdale	68	37	600	---	9.0	5.5	8.0
21---- Montevallo-Nauvoo	---	---	---	---	---	---	---
22**:							
Montevallo----	---	---	---	---	---	---	---

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Soybeans	Cotton lint	Wheat	Improved bermuda-grass	Tall fescue	Bahiagrass
	Bu	Bu	Lb	Bu	AUM*	AUM*	AUM*
22**: Nauvoo	---	---	---	---	---	---	---
23---- Nauvoo	60	25	650	25	7.5	8.0	6.5
24, 25---- Palmerdale	---	---	---	---	---	---	---
26** Pits.							
27---- Ruston	90	35	700	35	10.0	8.0	9.5
28---- Ruston	85	30	650	35	10.0	8.0	9.5
29---- Shatta	70	28	600	25	8.5	7.5	7.0
30---- Shatta	65	26	550	30	9.0	8.0	7.0
31---- Shatta-Urban land	---	---	---	---	---	---	---
32---- Shatta-Urban land	---	---	---	---	---	---	---
33---- Smithdale	50	25	400	25	9.0	6.0	8.0
34---- Smithdale	---	---	---	---	7.0	5.0	7.0
35---- Smithdale-Flomaton	---	---	---	---	5.0	---	---
36---- Smithdale-Luverne	---	---	---	---	5.0	4.5	5.0
37---- Smithdale-Urban land	---	---	---	---	---	---	---
38**---- Smithdale	---	---	---	---	---	---	---
39**: Smithdale----	---	---	---	---	7.0	5.0	7.0
Luverne----	---	---	---	---	8.0	5.0	7.0
40**: Smithdale----	---	---	---	---	7.0	5.0	7.0
Pikeville----	---	---	---	---	6.5	5.0	6.5
41** Urban land.							

* 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.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
2---------- Adaton	2w	Slight	Severe	Severe	Slight	Water oak---------- Loblolly pine------- Sweetgum----------	80 80 80	Shumard oak, loblolly pine, sweetgum.
3*: Allen----------	3o	Slight	Slight	Slight	Slight	Loblolly pine------- Yellow-poplar------- Shortleaf pine------	80 87 72	Loblolly pine, yellow-poplar.
Bodine----------	3f	Slight	Moderate	Moderate	Slight	Shortleaf pine------ Yellow-poplar------- Southern red oak---- Black oak----------	60 90 70 70	Loblolly pine.
4*---------- Augusta-Amy	2w	Slight	Moderate	Slight	Slight	Loblolly pine------- Sweetgum---------- American sycamore--- White oak---------- Southern red oak---- Water oak---------- Shortleaf pine------	90 90 90 80 80 --- ---	Loblolly pine, sweetgum, American sycamore, cherrybark oak, water oak.
5, 6---------- Bama	3o	Slight	Slight	Slight	Slight	Loblolly pine------- Shortleaf pine------	85 75	Loblolly pine.
9*---------- Bibb	2w	Slight	Severe	Severe	Moderate	Loblolly pine------- Sweetgum---------- Water oak----------	90 90 90	Loblolly pine, sweetgum, water oak.
10*: Bodine----------	3f	Slight	Moderate	Moderate	Slight	Shortleaf pine------ Yellow-poplar------- Southern red oak---- Black oak----------	60 90 70 70	Loblolly pine.
Allen----------	3r	Moderate	Moderate	Slight	Slight	Loblolly pine------- Virginia pine------- Southern red oak----	80 73 71	Loblolly pine.
11---------- Boswell	3c	Slight	Moderate	Moderate	Moderate	Loblolly pine------- Shortleaf pine------	80 70	Loblolly pine.
12---------- Brilliant	3x	Severe	Severe	Severe	Slight	American sycamore--- Loblolly pine------- Virginia pine------- Sweetgum---------- Eastern cottonwood--	80 80 70 80 90	American sycamore, loblolly pine, Virginia pine, eastern cottonwood.
13---------- Cahaba	2o	Slight	Slight	Slight	Slight	Loblolly pine------- Yellow-poplar------- Sweetgum---------- Southern red oak---- White oak---------- Cherrybark oak------ Longleaf pine------- Blackgum----------	87 --- 90 --- --- --- 72 ---	Loblolly pine, yellow-poplar, sweetgum, American sycamore, cherrybark oak.

See footnote at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
14---------- Choccolocco	3o	Slight	Slight	Slight	Slight	Loblolly pine------- Shortleaf pine------ Southern red oak---- Virginia pine-------	80 70 70 70	Loblolly pine, yellow-poplar.
15---------- Decatur	3o	Slight	Slight	Slight	Slight	Shortleaf pine------ Yellow-poplar------- Loblolly pine------- Virginia pine-------	66 90 80 70	Yellow-poplar, loblolly pine.
16---------- Dundee	2w	Slight	Moderate	Slight	Slight	Cherrybark oak------ Eastern cottonwood-- Sweetgum---------- Water oak----------	105 100 100 95	Cherrybark oak, eastern cottonwood, sweetgum, water oak.
17---------- Ellisville	1o	Slight	Slight	Slight	Slight	Water oak---------- Yellow-poplar------- Sweetgum---------- Loblolly pine-------	100 110 100 100	Water oak, yellow-poplar, sweetgum, loblolly pine.
18---------- Falkner	2w	Slight	Moderate	Slight	Slight	Loblolly pine------- Shortleaf pine------ Sweetgum----------	85 75 90	Cherrybark oak, loblolly pine, sweetgum.
19*:								
Iuka----------	1w	Slight	Moderate	Moderate	Slight	Loblolly pine------- Sweetgum---------- Eastern cottonwood-- Water oak----------	100 100 105 100	Loblolly pine, eastern cottonwood, sweetgum, water oak.
Mantachie---------	1w	Slight	Severe	Severe	Slight	Green ash---------- Eastern cottonwood-- Cherrybark oak------ Loblolly pine------- Sweetgum----------	80 90 100 98 95	Green ash, eastern cottonwood, cherrybark oak, loblolly pine, sweetgum.
20*:								
Luverne----------	3c	Moderate	Moderate	Slight	Slight	Loblolly pine------- Longleaf pine-------	81 73	Loblolly pine, longleaf pine.
Smithdale---------	3o	Slight	Slight	Slight	Slight	Loblolly pine------- Shortleaf pine------	80 69	Loblolly pine.
21*, 22*:								
Montevallo--------	4d	Severe	Moderate	Moderate	Moderate	Loblolly pine------- Shortleaf pine------ Virginia pine-------	66 61 57	Loblolly pine, Virginia pine.
Nauvoo----------	2o	Slight	Slight	Slight	Slight	Loblolly pine------- Shortleaf pine------ Virginia pine------- Yellow-poplar------- Sweetgum----------	89 80 80 100 90	Loblolly pine, yellow-poplar, sweetgum.
23---------- Nauvoo	2o	Slight	Slight	Slight	Slight	Loblolly pine------- Shortleaf pine------ Virginia pine------- Yellow-poplar------- Sweetgum----------	89 80 80 100 90	Loblolly pine, yellow-poplar, sweetgum.

See footnote at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
24, 25--- Palmerdale	3x	Severe	Severe	Severe	Slight	Sweetgum--- Loblolly pine--- Virginia pine--- American sycamore--- Eastern cottonwood--	80 80 70 90 90	Loblolly pine, Virginia pine, American sycamore, eastern cottonwood.
27, 28--- Ruston	3o	Slight	Slight	Slight	Slight	Loblolly pine--- Shortleaf pine---	84 75	Loblolly pine.
29, 30--- Shatta	3o	Slight	Slight	Slight	Slight	Loblolly pine--- Shortleaf pine--- Sweetgum---	83 77 ---	Loblolly pine.
33, 34--- Smithdale	3o	Slight	Slight	Slight	Slight	Loblolly pine--- Shortleaf pine---	80 69	Loblolly pine.
35*: Smithdale---	3o	Slight	Slight	Slight	Slight	Loblolly pine--- Shortleaf pine---	80 69	Loblolly pine.
Flomaton---	4f	Moderate	Moderate	Moderate	Slight	Loblolly pine--- Longleaf pine--- Shortleaf pine---	70 60 60	Longleaf pine, loblolly pine.
36*: Smithdale---	3o	Slight	Slight	Slight	Slight	Loblolly pine--- Shortleaf pine---	80 69	Loblolly pine.
Luverne---	3c	Moderate	Moderate	Slight	Slight	Loblolly pine--- Longleaf pine---	81 73	Loblolly pine. longleaf pine.
38*--- Smithdale	3o	Slight	Slight	Slight	Slight	Loblolly pine--- Shortleaf pine---	80 69	Loblolly pine.
39*: Smithdale---	3o	Slight	Slight	Slight	Slight	Loblolly pine--- Shortleaf pine---	80 69	Loblolly pine.
Luverne---	3c	Moderate	Moderate	Slight	Slight	Loblolly pine--- Longleaf pine---	81 73	Loblolly pine, longleaf pine.
40*: Smithdale---	3o	Slight	Slight	Slight	Slight	Loblolly pine--- Shortleaf pine---	80 69	Loblolly pine.
Pikeville---	3f	Moderate	Moderate	Moderate	Slight	Loblolly pine--- Shortleaf pine--- Virginia pine---	80 70 70	Loblolly pine.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
2--- Adaton	Severe: floods, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
3*:					
Allen---	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight---	Moderate: slope.
Bodine---	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Severe: small stones.	Severe: small stones.
4*:					
Augusta---	Severe: floods, wetness.	Moderate: floods, wetness.	Severe: wetness, floods.	Moderate: wetness, floods.	Severe: floods.
Amy---	Severe: floods, wetness.	Severe: wetness.	Severe: wetness, floods.	Severe: wetness.	Severe: wetness, floods.
5--- Bama	Slight---	Slight---	Slight---	Slight---	Slight.
6--- Bama	Slight---	Slight---	Moderate: slope.	Slight---	Slight.
7*:					
Bama---	Slight---	Slight---	Slight---	Slight---	Slight.
Urban land.					
8*:					
Bama---	Slight---	Slight---	Moderate: slope.	Slight---	Slight.
Urban land.					
9*--- Bibb	Severe: floods, wetness.	Severe: wetness.	Severe: wetness, floods.	Severe: wetness.	Severe: wetness, floods.
10*:					
Bodine---	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones, slope.
Allen---	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
11--- Boswell	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Slight---	Slight.
12--- Brilliant	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones, slope.
13--- Cahaba	Severe: floods.	Slight---	Moderate: slope.	Slight---	Slight.
14--- Choccolocco	Severe: floods.	Slight---	Slight---	Slight---	Slight.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
15--- Decatur	Slight	Slight	Moderate: slope.	Slight	Slight.
16--- Dundee	Severe: floods.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
17--- Ellisville	Severe: floods.	Moderate: floods.	Severe: floods.	Severe: erodes easily.	Severe: floods.
18--- Falkner	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness.
19*: Iuka	Severe: floods, wetness.	Moderate: floods, wetness.	Severe: wetness, floods.	Moderate: wetness, floods.	Severe: floods.
Mantachie	Severe: floods, wetness.	Moderate: floods, wetness.	Severe: wetness, floods.	Moderate: wetness, floods.	Severe: floods.
20*: Luverne	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Severe: erodes easily.	Slight.
Smithdale	Slight	Slight	Severe: slope.	Slight	Slight.
21*, 22*: Montevallo	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, erodes easily.	Severe: droughty, slope, thin layer.
Nauvoo	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
23--- Nauvoo	Slight	Slight	Severe: slope.	Slight	Slight.
24, 25--- Palmerdale	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones, droughty, slope.
26* Pits.					
27--- Ruston	Slight	Slight	Moderate: small stones.	Slight	Slight.
28--- Ruston	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
29--- Shatta	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Severe: erodes easily.	Moderate: wetness.
30--- Shatta	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: slope, percs slowly, wetness.	Severe: erodes easily.	Moderate: wetness.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
31*:					
Shatta	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Severe: erodes easily.	Moderate: wetness.
Urban land.					
32*:					
Shatta	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: slope, percs slowly, wetness.	Severe: erodes easily.	Moderate: wetness.
Urban land.					
33 Smithdale	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
34 Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
35*:					
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Flomaton	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: small stones, droughty, slope.
36*:					
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Luverne	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
37*:					
Smithdale	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Urban land.					
38* Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
39*:					
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Luverne	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
40*:					
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Pikeville	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
41* Urban land.					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
2---- Adaton	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
3*:										
Allen----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Bodine----	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
4*---- Augusta-Amy	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
5---- Bama	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
6---- Bama	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
7*:										
Bama----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Urban land.										
8*:										
Bama----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Urban land.										
9*---- Bibb	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
10*:										
Bodine----	Very poor.	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.
Allen----	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
11---- Boswell	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
12---- Brilliant	Very poor.	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
13---- Cahaba	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
14---- Choccolocco	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
15---- Decatur	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
16---- Dundee	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.

See footnote at end of table.

TABLE 8.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
17---------- Ellisville	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
18---------- Falkner	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
19*:										
Iuka----------	Poor	Fair	Fair	Good	Good	Poor	Poor	Fair	Good	Poor.
Mantachie----------	Poor	Fair	Fair	Good	Fair	Fair	Fair	Fair	Good	Fair.
20*:										
Luverne----------	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.
21*, 22*:										
Montevallo--------	Very poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Nauvoo----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
23---------- Nauvoo	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
24, 25---------- Palmerdale	Very poor	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
26* Pits.										
27, 28---------- Ruston	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
29, 30---------- Shatta	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
31*, 32*:										
Shatta----------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Urban land.										
33---------- Smithdale	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
34---------- Smithdale	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
35*:										
Smithdale----------	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Flomaton----------	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
36*:										
Smithdale----------	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Luverne----------	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

See footnote at end of table.

TABLE 8.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
37*: Smithdale	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Urban land.										
38* Smithdale	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
39*: Smithdale	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Luverne	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
40*: Smithdale	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Pikeville	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
41* Urban land.										

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
2---- Adaton	Severe: wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: wetness.	Severe: wetness.
3*:						
Allen----	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
Bodine----	Moderate: large stones, slope.	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope.	Moderate: slope, large stones.	Severe: small stones.
4*:						
Augusta----	Severe: wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods.	Severe: floods.
Amy----	Severe: wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: low strength, wetness, floods.	Severe: wetness, floods.
5---- Bama	Slight----	Slight----	Slight----	Slight----	Slight----	Slight.
6---- Bama	Slight----	Slight----	Slight----	Moderate: slope.	Slight----	Slight.
7*:						
Bama----	Slight----	Slight----	Slight----	Slight----	Slight----	Slight.
Urban land.						
8*:						
Bama----	Slight----	Slight----	Slight----	Moderate: slope.	Slight----	Slight.
Urban land.						
9*---- Bibb	Severe: wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: wetness, floods.	Severe: wetness, floods.
10*:						
Bodine----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
Allen----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
11---- Boswell	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
12---- Brilliant	Severe: slope.	Severe: slope, unstable fill.	Severe: slope, unstable fill.	Severe: slope, unstable fill.	Severe: slope, unstable fill.	Severe: small stones, slope.
13---- Cahaba	Slight----	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods.	Slight.
14---- Choccolocco	Slight----	Severe: floods.	Severe: floods.	Severe: floods.	Severe: low strength.	Slight.

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
15--- Decatur	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: low strength.	Slight.
16--- Dundee	Severe: wetness.	Severe: floods.	Severe: floods, wetness.	Severe: floods.	Moderate: wetness, floods, shrink-swell.	Moderate: wetness.
17--- Ellisville	Moderate: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: low strength, floods.	Severe: floods.
18--- Falkner	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Moderate: wetness.
19*:						
Iuka---	Severe: wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods.	Severe: floods.
Mantachie---	Severe: wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods.	Severe: floods.
20*:						
Luverne---	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
Smithdale---	Slight---	Slight---	Slight---	Moderate: slope.	Slight---	Slight.
21*, 22*:						
Montevallo---	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope, thin layer.
Nauvoo---	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
23--- Nauvoo	Slight---	Slight---	Slight---	Moderate: slope.	Moderate: low strength.	Slight.
24, 25--- Palmerdale	Severe: slope.	Severe: slope, unstable fill.	Severe: slope, unstable fill.	Severe: slope, unstable fill.	Severe: slope, unstable fill.	Severe: small stones, droughty, slope.
26* Pits.						
27--- Ruston	Slight---	Slight---	Slight---	Slight---	Moderate: low strength.	Slight.
28--- Ruston	Slight---	Slight---	Slight---	Moderate: slope.	Moderate: low strength.	Slight.
29--- Shatta	Moderate: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength, wetness.	Moderate: wetness.
30--- Shatta	Moderate: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: slope, wetness.	Severe: low strength, wetness.	Moderate: wetness.

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
31*:						
Shatta	Moderate: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength, wetness.	Moderate: wetness.
Urban land.						
32*:						
Shatta	Moderate: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: slope, wetness.	Severe: low strength, wetness.	Moderate: wetness.
Urban land.						
33---------- Smithdale	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
34---------- Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
35*:						
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Flomaton	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, droughty, slope.
36*:						
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Luverne	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
37*:						
Smithdale	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
Urban land.						
38* Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
39*:						
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Luverne	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
40*:						
Smithdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Pikeville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
41* Urban land.						

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
2 Adaton	Severe: percs slowly, wetness.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness, hard to pack.
3*: Allen	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
Bodine	Moderate: slope, large stones.	Severe: seepage, slope, large stones.	Severe: seepage, large stones.	Severe: seepage.	Poor: small stones.
4*: Augusta	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, seepage, wetness.	Severe: floods, wetness.	Fair: wetness.
Amy	Severe: floods, wetness, percs slowly.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness.
5 Bama	Slight	Moderate: seepage.	Slight	Slight	Good.
6 Bama	Slight	Moderate: seepage, slope.	Slight	Slight	Good.
7*: Bama	Slight	Moderate: seepage.	Slight	Slight	Good.
Urban land.					
8*: Bama	Slight	Moderate: seepage, slope.	Slight	Slight	Good.
Urban land.					
9* Bibb	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness.
10*: Bodine	Severe: slope.	Severe: seepage, slope, large stones.	Severe: seepage, slope, large stones.	Severe: seepage, slope.	Poor: small stones, slope.
Allen	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
11 Boswell	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
12--Brilliant	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope.
13--Cahaba	Moderate: floods.	Severe: seepage, floods.	Severe: seepage.	Moderate: floods.	Fair: thin layer.
14--Choccolocco	Moderate: floods.	Severe: seepage.	Severe: seepage.	Moderate: floods.	Good.
15--Decatur	Slight	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, hard to pack.
16--Dundee	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
17--Ellisville	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Fair: too clayey.
18--Falkner	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Moderate: wetness.	Poor: hard to pack.
19*:					
Iuka	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Fair: wetness.
Mantachie	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness.
20*:					
Luverne	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
Smithdale	Moderate: percs slowly.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: too clayey.
21*, 22*:					
Montevallo	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, thin layer.
Nauvoo	Severe: slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: slope.
23--Nauvoo	Moderate: depth to rock, percs slowly.	Severe: slope.	Severe: depth to rock.	Slight	Fair: area reclaim.
24, 25--Palmerdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope.
26* Pits.					
27--Ruston	Moderate: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight	Fair: too clayey.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
28--Ruston	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
29--Shatta	Severe: percs slowly, wetness.	Slight	Moderate: too clayey, wetness.	Moderate: wetness.	Fair: too clayey, wetness.
30--Shatta	Severe: percs slowly, wetness.	Moderate: slope.	Moderate: too clayey, wetness.	Moderate: wetness.	Fair: too clayey, wetness.
31*: Shatta	Severe: percs slowly, wetness.	Slight	Moderate: too clayey, wetness.	Moderate: wetness.	Fair: too clayey, wetness.
Urban land.					
32*: Shatta	Severe: percs slowly, wetness.	Moderate: slope.	Moderate: too clayey, wetness.	Moderate: wetness.	Fair: too clayey, wetness.
Urban land.					
33--Smithdale	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: too clayey, slope.
34--Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
35*: Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Flomaton	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: seepage, small stones.
36*: Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Luverne	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
37*: Smithdale	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: too clayey, slope.
Urban land.					
38*--Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
39*: Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
39*:					
Luverne	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
40*:					
Smithdale	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Pikeville	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
41* Urban land.					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," "probable," and "improbable." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
2---------- Adaton	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, thin layer.
3*: Allen----------	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Bodine----------	Fair: large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: small stones, area reclaim.
4*: Augusta----------	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Amy----------	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
5, 6---------- Bama	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.
7*, 8*: Bama----------	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.
Urban land.				
9*---------- Bibb	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
10*: Bodine----------	Poor: slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: small stones, area reclaim, slope.
Allen----------	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
11---------- Boswell	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
12---------- Brilliant	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
13---------- Cahaba	Good----------	Improbable: excess fines.	Improbable: excess fines.	Good.
14---------- Choccolocco	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
15---------- Decatur	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
16---------- Dundee	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
17--- Ellisville	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
18--- Falkner	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
19*:				
Iuka---	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Mantachie---	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
20*:				
Luverne---	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Smithdale---	Good---	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
21*, 22*:				
Montevallo---	Poor: area reclaim, thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, thin layer.
Nauvoo---	Fair: area reclaim, thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
23--- Nauvoo	Fair: area reclaim, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
24, 25--- Palmerdale	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
26* Pits.				
27, 28--- Ruston	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
29, 30--- Shatta	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
31*, 32*:				
Shatta---	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Urban land.				
33--- Smithdale	Good---	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
34--- Smithdale	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
35*:				
Smithdale---	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
35*:				
Flomaton	Poor: slope.	Probable	Probable	Poor: small stones, area reclaim.
36*:				
Smithdale	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Luverne	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
37*:				
Smithdale	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
Urban land.				
38* Smithdale	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
39*:				
Smithdale	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Luverne	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
40*:				
Smithdale	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Pikeville	Fair: slope.	Improbable: excess fines.	Probable	Poor: small stones, area reclaim, slope.
41* Urban land.				

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated]

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
2---------- Adaton	Slight---------	Severe: wetness.	Percs slowly---	Wetness, percs slowly.	Percs slowly, wetness.	Wetness, percs slowly.
3*: Allen----------	Moderate: seepage.	Severe: piping.	Deep to water	Slope----------	Slope----------	Slope.
Bodine----------	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Large stones, droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
4*: Augusta----------	Moderate: seepage.	Severe: piping, wetness.	Floods---------	Wetness, floods.	Wetness--------	Wetness.
Amy----------	Moderate: seepage.	Severe: wetness.	Percs slowly, floods.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
5---------- Bama	Moderate: seepage.	Slight---------	Deep to water	Favorable------	Favorable------	Favorable.
6---------- Bama	Moderate: seepage, slope.	Slight---------	Deep to water	Slope----------	Favorable------	Favorable.
7*: Bama----------	Moderate: seepage.	Slight---------	Deep to water	Favorable------	Favorable------	Favorable.
Urban land.						
8*: Bama----------	Moderate: seepage, slope.	Slight---------	Deep to water	Slope----------	Favorable------	Favorable.
Urban land.						
9*---------- Bibb	Moderate: seepage.	Severe: piping, wetness.	Floods---------	Wetness, floods.	Wetness--------	Wetness.
10*: Bodine----------	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Large stones, droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
Allen----------	Severe: slope.	Severe: piping.	Deep to water	Slope----------	Slope----------	Slope.
11---------- Boswell	Slight---------	Severe: hard to pack.	Deep to water	Percs slowly, slope, erodes easily.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
12---------- Brilliant	Severe: seepage, slope.	Severe: seepage.	Deep to water	Droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
13---------- Cahaba	Severe: seepage.	Moderate: thin layer, piping.	Deep to water	Favorable------	Favorable------	Favorable.
14---------- Choccolocco	Moderate: seepage.	Severe: piping.	Deep to water	Favorable------	Erodes easily	Erodes easily.

See footnote at end of table.

TABLE 12.--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
15---------- Decatur	Moderate: seepage.	Severe: hard to pack.	Deep to water	Slope----------	Favorable------	Favorable.
16---------- Dundee	Moderate: seepage.	Severe: piping, wetness.	Favorable------	Wetness, rooting depth.	Erodes easily, wetness.	Erodes easily, rooting depth.
17---------- Ellisville	Moderate: seepage.	Moderate: piping.	Deep to water	Erodes easily, floods.	Erodes easily	Erodes easily.
18---------- Falkner	Slight---------	Severe: hard to pack.	Percs slowly---	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Erodes easily, percs slowly.
19*: Iuka----------	Moderate: seepage.	Severe: piping, wetness.	Floods---------	Wetness, floods.	Wetness--------	Wetness.
Mantachie--------	Moderate: seepage.	Severe: piping, wetness.	Floods---------	Wetness, floods.	Wetness--------	Wetness.
20*: Luverne----------	Moderate: slope.	Severe: hard to pack.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
Smithdale--------	Severe: seepage.	Severe: piping.	Deep to water	Slope----------	Favorable------	Favorable.
21*, 22*: Montevallo-------	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Droughty, depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, droughty.
Nauvoo----------	Severe: slope.	Moderate: thin layer, piping.	Deep to water	Slope----------	Slope----------	Slope.
23---------- Nauvoo	Moderate: seepage, depth to rock, slope.	Moderate: thin layer, piping.	Deep to water	Slope----------	Favorable------	Favorable.
24, 25---------- Palmerdale	Severe: seepage, slope.	Severe: seepage.	Deep to water	Large stones, droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
26* Pits.						
27---------- Ruston	Moderate: seepage.	Severe: thin layer.	Deep to water	Favorable------	Favorable------	Favorable.
28---------- Ruston	Moderate: seepage, slope.	Severe: thin layer.	Deep to water	Slope----------	Favorable------	Favorable.
29---------- Shatta	Slight---------	Severe: piping.	Percs slowly---	Percs slowly, rooting depth, wetness.	Erodes easily, wetness, percs slowly.	Erodes easily, rooting depth, percs slowly.
30---------- Shatta	Moderate: slope.	Severe: piping.	Slope, percs slowly.	Percs slowly, wetness, slope.	Erodes easily, wetness, percs slowly.	Erodes easily, rooting depth, percs slowly.
31*: Shatta----------	Slight---------	Severe: piping.	Percs slowly---	Percs slowly, rooting depth, wetness.	Erodes easily, wetness, percs slowly.	Erodes easily, rooting depth, percs slowly.

See footnote at end of table.

TABLE 12.--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
31*: Urban land.						
32*: Shatta	Moderate: slope.	Severe: piping.	Slope, percs slowly.	Percs slowly, wetness, slope.	Erodes easily, wetness, percs slowly.	Erodes easily, rooting depth, percs slowly.
Urban land.						
33--- Smithdale	Severe: seepage.	Severe: piping.	Deep to water	Slope---	Slope---	Slope.
34--- Smithdale	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope---	Slope---	Slope.
35*: Smithdale	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope---	Slope---	Slope.
Flomaton	Severe: seepage, slope.	Severe: seepage.	Deep to water	Droughty, fast intake, slope.	Slope, too sandy.	Slope, droughty.
36*: Smithdale	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope---	Slope---	Slope.
Luverne	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
37*: Smithdale	Severe: seepage.	Severe: piping.	Deep to water	Slope---	Slope---	Slope.
Urban land.						
38*--- Smithdale	Severe: seepage.	Severe: piping.	Deep to water	Slope---	Slope---	Slope.
39*: Smithdale	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope---	Slope---	Slope.
Luverne	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
40*: Smithdale	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope---	Slope---	Slope.
Pikeville	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope---	Slope, erodes easily.	Slope, erodes easily.
41* Urban land.						

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
2---------- Adaton	0-7	Silt loam--------	ML, CL, CL-ML	A-4	0	100	98-100	90-100	84-100	<30	NP-10
	7-96	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
3*:											
Allen----------	0-15	Fine sandy loam	ML, CL-ML, SM, SM-SC	A-4	0-5	90-100	75-100	65-98	40-80	<26	NP-7
	15-46	Clay loam, sandy clay loam, loam.	CL-ML, CL	A-4, A-6, A-7	0-10	85-100	75-100	65-98	50-80	22-43	5-19
	46-60	Clay loam, sandy clay loam, clay.	CL-ML, CL, SC, SM-SC	A-4, A-6, A-7	0-10	85-100	70-95	60-95	45-80	22-48	6-22
Bodine----------	0-5	Cherty loam------	ML, CL-ML, GM, SM	A-4, A-2, A-1	5-25	30-90	20-75	20-67	20-62	<30	NP-7
	5-21	Cherty silt loam, cherty silty clay loam, stony silt loam.	GM-GC, GC, SC, SM-SC	A-1, A-2, A-4, A-6	20-45	30-70	20-65	20-55	15-45	20-38	3-15
	21-62	Cherty silty clay loam, cherty clay loam, very cherty silty clay loam.	GC, GM, SC, SM	A-2	20-55	20-70	15-65	15-45	12-35	26-42	8-16
4*:											
Augusta----------	0-9	Loam-------------	ML, CL-ML	A-4	0	90-100	75-100	75-100	51-75	<35	NP-10
	9-59	Sandy clay loam, clay loam, clay.	CL, CL-ML	A-4, A-6, A-7	0	90-100	75-100	75-95	51-80	20-45	5-25
	59-72	Coarse sandy loam, loam, gravelly loamy sand.	SM, SP-SM, ML, SM-SC	A-2, A-4, A-1	0	75-100	55-100	30-90	10-70	<25	NP-5
Amy----------	0-14	Silt loam--------	ML	A-4	0	100	95-100	90-100	70-95	<30	NP-5
	14-48	Silt loam, silty clay loam.	CL	A-4, A-6	0	100	95-100	95-100	85-95	25-40	8-20
	48-60	Fine sandy loam, silt loam, silty clay loam.	ML, SM, CL-ML, CL	A-4, A-6	0	100	95-100	80-95	40-90	<35	NP-20
5, 6---------- Bama	0-5	Fine sandy loam	SM, SC, ML, CL	A-2, A-4	0	95-100	85-100	70-95	30-70	<30	NP-10
	5-54	Loam, sandy clay loam.	SM, SC, ML, CL	A-4, A-6	0	90-100	85-100	80-95	36-70	15-35	2-15
	54-72	Loam, sandy clay loam, clay loam.	SC, CL	A-4, A-6	0	85-100	80-100	80-95	40-70	20-40	8-18
7*, 8*:											
Bama----------	0-5	Fine sandy loam	SM, SC, SM-SC, CL-ML	A-2, A-4	0	95-100	85-100	70-95	30-70	<30	NP-10
	5-54	Loam, sandy clay loam.	SM, SC, SM-SC, CL-ML	A-4, A-6	0	90-100	85-100	80-95	36-70	15-35	2-15
	54-72	Loam, sandy clay loam, clay loam.	SC, CL	A-4, A-6	0	85-100	80-100	80-95	40-70	20-40	8-18
Urban land.											
9*---------- Bibb	0-10	Silt loam--------	SM, SM-SC, ML, CL-ML	A-2, A-4	0-5	95-100	90-100	60-90	30-60	<25	NP-7
	10-62	Sandy loam, loam, silt loam.	SM, SM-SC, ML, CL-ML	A-2, A-4	0-10	60-100	50-100	40-100	30-90	<30	NP-7

See footnote at end of table.

TABLE 13.--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	
10*:											
Bodine	0-5	Cherty loam	ML, CL-ML, GM, SM	A-4, A-2, A-1	5-25	30-90	20-75	20-67	20-62	<30	NP-7
	5-21	Cherty silt loam, cherty silty clay loam, stony silt loam.	GM-GC, GC, SC, SM-SC	A-1, A-2, A-4, A-6	20-45	30-70	20-65	20-55	15-45	20-38	3-15
	21-62	Cherty silty clay loam, cherty clay loam, very cherty silty clay loam.	GC, GM, SC, SM	A-2	20-55	20-70	15-65	15-45	12-35	26-42	8-16
Allen	0-15	Fine sandy loam	ML, CL-ML, SM, SM-SC	A-4	0-5	90-100	75-100	65-98	40-80	<26	NP-7
	15-46	Clay loam, sandy clay loam, loam.	CL-ML, CL	A-4, A-6, A-7	0-10	85-100	75-100	65-98	50-80	22-43	5-19
	46-60	Clay loam, sandy clay loam, clay.	CL-ML, CL, SC, SM-SC	A-4, A-6, A-7	0-10	85-100	70-95	60-95	45-80	22-48	6-22
11--Boswell	0-4	Loam	ML, CL, CL-ML	A-4, A-6	0	98-100	98-100	85-100	75-95	20-35	3-12
	4-75	Clay, silty clay, silty clay loam.	CH	A-7	0	98-100	98-100	90-100	75-95	50-70	25-40
12--Brilliant	0-70	Very shaly loam	SM, SC, SM-SC, SP-SM	A-2-4, A-2-6, A-1	15-30	40-90	15-75	10-40	9-30	<30	NP-16
13--Cahaba	0-4	Sandy loam	SM	A-4, A-2	0	95-100	95-100	65-90	30-45	---	NP
	4-37	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
	37-63	Sand, loamy sand, fine sandy loam.	SM, SP-SM	A-2	0	95-100	90-100	60-85	10-35	---	NP
14--Choccolocco	0-6	Silt loam	ML, SM	A-4	0	94-100	85-100	70-98	43-90	28-40	NP-8
	6-38	Silty clay loam, silt loam, loam.	ML	A-4, A-6, A-7	0	95-100	95-100	85-98	60-95	35-45	7-14
	38-72	Sandy loam, loam	SM, ML, SM-SC, CL-ML	A-2, A-4	0	95-100	89-100	60-95	30-75	<35	NP-7
15--Decatur	0-4	Loam	CL, ML, CL-ML	A-4, A-6	0-3	90-100	90-98	85-98	65-80	20-32	NP-12
	4-30	Silty clay loam, silty clay, clay.	ML, CL	A-7, A-4, A-6	0-3	90-100	90-100	88-99	78-92	30-49	8-22
	30-72	Clay	CL, ML, MH, CH	A-7, A-6	0-3	90-100	90-100	88-98	75-90	37-60	11-28
16--Dundee	0-13	Silt loam	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	75-98	20-35	3-11
	13-36	Loam, silty clay loam, clay loam.	CL	A-6, A-7	0	100	100	90-100	70-95	28-44	12-22
	36-72	Loam, very fine sandy loam, silt loam.	CL, CL-ML, ML	A-4	0	100	100	85-100	60-90	<30	NP-8
17--Ellisville	0-9	Silt loam	CL, CL-ML, SC, SM-SC	A-6, A-4	0	100	100	55-100	40-100	18-38	4-15
	9-68	Silt loam, silty clay loam.	CL	A-6, A-4	0	100	100	80-100	65-100	23-38	8-15
18--Falkner	0-12	Silt loam	CL-ML, CL	A-4	0	100	100	95-100	90-100	20-30	5-10
	12-83	Silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	95-100	85-95	30-45	15-30

See footnote at end of table.

TABLE 13.--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	
19*:											
Iuka	0-10	Silt loam	SM, SM-SC, ML, CL-ML	A-4	0	95-100	90-100	70-95	45-75	<30	NP-7
	10-18	Fine sandy loam, loam, silt loam.	SM, SM-SC, ML, CL-ML	A-4	0	95-100	85-100	65-100	36-75	<30	NP-7
	18-72	Sandy loam, fine sandy loam, loamy sand.	SM, ML, SM-SC	A-2, A-4, A-2	0	95-100	90-100	70-100	25-60	<30	NP-7
Mantachie	0-6	Loam	CL-ML, SM-SC, SM, ML	A-4	0-5	95-100	90-100	60-85	40-60	<20	NP-5
	6-60	Loam, clay loam, sandy clay loam.	CL, SC, SM-SC, CL-ML	A-4, A-6	0-5	95-100	90-100	80-95	45-80	20-40	5-15
20*:											
Luverne	0-4	Fine sandy loam	ML, SM	A-2, A-4	0-5	87-100	84-100	80-100	19-75	<20	NP
	4-39	Clay loam, sandy clay, clay.	ML, MH, CH, CL	A-5, A-7	0-5	95-100	90-100	85-100	50-95	38-70	8-30
	39-80	Stratified loamy sand to clay.	---	---	---	---	---	---	---	---	---
Smithdale	0-5	Fine sandy loam	SM, SM-SC	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
	5-42	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
21*, 22*:											
Montevallo	0-7	Shaly loam	SM-SC, SC, CL-ML, CL	A-4	0-5	60-88	50-75	45-70	40-65	<30	NP-10
	7-12	Shaly silt loam, shaly loam, shaly silty clay loam.	GM-GC, GC, SM-SC, SC	A-2, A-4, A-6	0-5	35-70	23-50	15-45	15-40	20-40	2-15
	12-20	Weathered bedrock	---	---	---	---	---	---	---	---	---
Nauvoo	0-17	Fine sandy loam	SM-SC, CL-ML, SC, CL	A-4	0-3	90-100	85-100	55-93	35-65	<30	NP-8
	17-35	Loam, sandy clay loam, clay loam.	SC, CL, ML	A-4, A-6, A-7	0-3	95-100	90-100	60-95	40-80	30-50	8-24
	35-41	Fine sandy loam, loam, sandy clay loam.	SM-SC, CL-ML, SC, CL	A-4, A-6	0-5	90-100	85-100	55-90	35-65	18-34	4-15
	41-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
23---------- Nauvoo	0-17	Fine sandy loam	SM-SC, CL-ML, SC, CL	A-4	0-3	90-100	85-100	55-93	35-65	<30	NP-8
	17-35	Loam, sandy clay loam, clay loam.	SC, CL, ML	A-4, A-6, A-7	0-3	95-100	90-100	60-95	40-80	30-50	8-24
	35-41	Fine sandy loam, loam, sandy clay loam.	SM-SC, CL-ML, SC, CL	A-4, A-6	0-5	90-100	85-100	55-90	35-65	18-34	4-15
	41-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
24---------- Palmerdale	0-23	Very gravelly loam.	GC, SM, GM, SC	A-1, A-2, A-3, A-4	0-15	40-85	15-75	10-60	9-40	<30	NP-10
	23-80	Very shaly silt loam, very shaly loam, shaly silty clay loam.	GC, SM, GM, SC	A-2, A-4, A-6, A-1	15-30	40-85	15-75	10-60	9-40	25-40	3-16

See footnote at end of table.

TABLE 13.--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	
25---------- Palmerdale	0-5	Very shaly loam	GM, SC, GC, SM	A-2, A-4, A-6, A-1	15-30	40-85	15-75	10-60	9-40	25-40	3-16
	5-80	Very shaly silt loam, very shaly loam, shaly silty clay loam.	GC, SM, GM, SC	A-2, A-4, A-6, A-1	15-30	40-85	15-75	10-60	9-40	25-40	3-16
26* Pits.											
27, 28---------- Ruston	0-3	Fine sandy loam	SM, ML	A-4, A-2	0	85-100	78-100	65-100	30-75	<20	NP-3
	3-51	Sandy clay loam, loam, clay loam.	SC, CL	A-6	0	85-100	78-100	70-100	36-75	30-40	11-20
	51-81	Sandy clay loam, loam, clay loam.	SC, CL	A-6	0	85-100	78-100	70-100	36-75	30-42	11-20
29, 30---------- Shatta	0-7	Silt loam--------	ML, CL-ML	A-4	0	100	100	90-100	55-90	23-28	3-7
	7-28	Silty clay loam, loam, silt loam.	CL	A-6	0	100	100	90-100	70-90	30-40	11-18
	28-60	Loam, silt loam, silty clay loam.	CL	A-6, A-4	0	100	100	90-100	60-90	27-35	8-14
31*, 32*: Shatta----------	0-7	Silt loam--------	ML, CL-ML	A-4	0	100	100	90-100	55-90	23-28	3-7
	7-28	Silty clay loam, loam, silt loam.	CL	A-6	0	100	100	90-100	70-90	30-40	11-18
	28-60	Loam, silt loam, silty clay loam.	CL	A-6, A-4	0	100	100	90-100	60-90	27-35	8-14
Urban land.											
33, 34---------- Smithdale	0-5	Fine sandy loam	SM, SM-SC	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
	5-42	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
35*: Smithdale-------	0-5	Fine sandy loam	SM, SM-SC	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
	5-42	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
Flomaton--------	0-27	Gravelly loamy sand.	GM, GP-GM, SM, SP-SM	A-1	0-5	30-80	30-75	20-40	5-25	<20	NP-4
	27-72	Very gravelly loamy sand, gravelly loamy sand, gravelly sandy loam.	GP-GM, GM-GC, SM-SC, GM	A-1, A-2	0-10	30-70	25-65	20-50	10-35	<20	NP-7
36*: Smithdale-------	0-5	Fine sandy loam	SM, SM-SC	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
	5-42	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
Luverne---------	0-4	Fine sandy loam	ML, SM	A-2, A-4	0-5	87-100	84-100	80-100	19-75	<20	NP
	4-39	Clay loam, sandy clay, clay.	ML, MH, CH, CL	A-5, A-7	0-5	95-100	90-100	85-100	50-95	38-70	8-30
	39-80	Stratified loamy sand to clay.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 13.--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	
37*:											
Smithdale-------	0-5	Fine sandy loam	SM, SM-SC	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
	5-42	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
Urban land.											
38*----------	0-5	Fine sandy loam	SM, SM-SC	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
Smithdale	5-42	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
39*:											
Smithdale-------	0-5	Fine sandy loam	SM, SM-SC	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
	5-42	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
Luverne---------	0-4	Fine sandy loam	ML, SM	A-2, A-4	0-5	87-100	84-100	80-100	19-75	<20	NP
	4-39	Clay loam, sandy clay, clay.	ML, MH, CH, CL	A-5, A-7	0-5	95-100	90-100	85-100	50-95	38-70	8-30
	39-80	Stratified loamy sand to clay.	---	---	---	---	---	---	---	---	---
40*:											
Smithdale-------	0-5	Fine sandy loam	SM, SM-SC	A-4, A-2	0	100	85-100	60-95	28-49	<20	NP-5
	5-42	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
Pikeville-------	0-16	Fine sandy loam	SM, ML	A-4	0	90-100	90-100	50-85	36-60	<30	NP-4
	16-25	Sandy clay loam, loam, gravelly loam.	SC, CL, SM-SC, CL-ML	A-4, A-6	0	80-100	65-100	60-90	36-60	20-40	4-17
	25-31	Gravelly sandy loam, gravelly loam, gravelly sandy clay loam.	SC, SM, GM	A-1, A-2 A-4, A-6	0	60-90	50-85	45-75	20-45	25-48	2-18
	31-72	Very gravelly sandy loam, very gravelly loam, very gravelly sandy clay loam.	GW-GM, GM, SW-SM, SM	A-1, A-2	0-5	35-75	20-65	15-55	9-30	20-45	2-16
41* Urban land.											

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF 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 <2mm	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
							K	T	
	In	Pct	In/hr	In/in	pH				Pct
2----------	0-7	10-27	0.6-2.0	0.20-0.22	4.5-5.5	Low----------	0.37	5	1-3
Adaton	7-96	20-42	0.06-0.2	0.18-0.22	4.5-5.5	Moderate-------	0.32		
3*:									
Allen----------	0-15	6-25	0.6-2.0	0.14-0.19	4.5-5.5	Low----------	0.24	5	.5-3
	15-46	18-35	0.6-2.0	0.12-0.17	4.5-5.5	Low----------	0.20		
	46-60	20-45	0.6-2.0	0.10-0.17	4.5-5.5	Low----------	0.20		
Bodine----------	0-5	7-27	2.0-6.0	0.07-0.12	3.6-5.5	Low----------	0.28	5	.5-2
	5-21	7-27	2.0-6.0	0.05-0.10	3.6-5.5	Low----------	0.28		
	21-62	18-35	2.0-6.0	0.05-0.10	3.6-5.5	Low----------	0.28		
4*:									
Augusta---------	0-9	10-25	0.6-2.0	0.15-0.22	4.5-6.0	Low----------	0.15	4	.5-2
	9-59	20-45	0.6-2.0	0.12-0.18	4.5-6.0	Low----------	0.24		
	59-72	3-18	2.0-6.0	0.06-0.12	4.5-6.0	Low----------	0.24		
Amy----------	0-14	15-25	0.6-2.0	0.13-0.24	4.5-5.5	Low----------	0.43	5	.5-2
	14-48	20-32	0.06-0.2	0.16-0.24	4.5-5.5	Low----------	0.43		
	48-60	11-35	0.6-2.0	0.11-0.15	4.5-5.5	Low----------	0.43		
5, 6----------	0-5	7-22	0.6-6.0	0.08-0.15	4.5-6.0	Low----------	0.24	5	.5-1
Bama	5-54	18-32	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.32		
	54-72	20-35	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.32		
7*, 8*:									
Bama----------	0-5	7-22	0.6-6.0	0.08-0.15	4.5-6.0	Low----------	0.24	5	.5-1
	5-54	18-32	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.32		
	54-72	20-35	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.32		
Urban land.									
9*----------	0-10	2-18	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.20	5	.5-2
Bibb	10-62	2-18	0.6-2.0	0.12-0.20	4.5-5.5	Low----------	0.37		
10*:									
Bodine----------	0-5	7-27	2.0-6.0	0.07-0.12	3.6-5.5	Low----------	0.28	5	.5-2
	5-21	7-27	2.0-6.0	0.05-0.10	3.6-5.5	Low----------	0.28		
	21-62	18-35	2.0-6.0	0.05-0.10	3.6-5.5	Low----------	0.28		
Allen----------	0-15	6-25	0.6-2.0	0.14-0.19	4.5-5.5	Low----------	0.24	5	.5-3
	15-46	18-35	0.6-2.0	0.12-0.17	4.5-5.5	Low----------	0.20		
	46-60	20-45	0.6-2.0	0.10-0.17	4.5-5.5	Low----------	0.20		
11----------	0-4	7-27	0.6-2.0	0.15-0.20	4.5-5.5	Low----------	0.43	5	.5-2
Boswell	4-75	38-80	<0.06	0.14-0.18	4.5-5.5	High----------	0.32		
12----------	0-70	8-25	2.0-6.0	0.04-0.10	5.6-8.4	Low----------	0.24	5	<.5
Brilliant									
13----------	0-4	7-17	2.0-6.0	0.05-0.14	4.5-6.0	Very low-------	0.24	4	.5-2
Cahaba	4-37	18-35	0.6-2.0	0.12-0.15	4.5-6.0	Low----------	0.28		
	37-63	4-20	2.0-20	0.05-0.10	4.5-6.0	Very low-------	0.24		
14----------	0-6	7-25	0.6-2.0	0.12-0.18	4.5-6.0	Low----------	0.32	5	1-3
Choccolocco	6-38	25-35	0.6-2.0	0.15-0.20	4.5-6.0	Low----------	0.37		
	38-72	10-30	2.0-6.0	0.10-0.16	4.5-6.0	Low----------	0.32		
15----------	0-4	15-40	0.6-2.0	0.18-0.20	4.5-6.0	Low----------	0.32	5	.5-1
Decatur	4-30	35-60	0.6-2.0	0.14-0.17	4.5-5.5	Moderate-------	0.32		
	30-72	35-60	0.6-2.0	0.12-0.16	4.5-5.5	Moderate-------	0.32		

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Clay <2mm	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
							K	T	
	In	Pct	In/hr	In/in	pH				Pct
16----------	0-13	10-30	0.6-2.0	0.15-0.20	4.5-6.0	Low----------	0.37	4	.5-1
Dundee	13-36	18-34	0.2-0.6	0.15-0.20	4.5-6.0	Moderate-------	0.32		
	36-72	18-35	0.6-2.0	0.15-0.20	4.5-7.3	Low----------	0.32		
17----------	0-9	15-35	0.6-2.0	0.12-0.22	5.1-5.5	Low----------	0.37	5	.5-3
Ellisville	9-68	18-35	0.6-2.0	0.18-0.22	4.5-5.5	Low----------	0.32		
18----------	0-12	5-18	0.2-0.6	0.20-0.22	4.5-6.0	Low----------	0.43	4	.5-3
Falkner	12-83	20-35	0.2-0.6	0.19-0.22	4.5-6.0	Moderate-------	0.43		
19*:									
Iuka----------	0-10	6-15	0.6-2.0	0.10-0.20	5.1-6.0	Low----------	0.24	5	.5-2
	10-18	8-18	0.6-2.0	0.10-0.20	4.5-5.5	Low----------	0.28		
	18-72	5-15	0.6-2.0	0.10-0.20	4.5-5.5	Low----------	0.20		
Mantachie-------	0-6	8-20	0.6-2.0	0.16-0.20	4.5-5.5	Low----------	0.28	5	1-3
	6-60	18-34	0.6-2.0	0.14-0.20	4.5-5.5	Low----------	0.28		
20*:									
Luverne---------	0-4	7-20	2.0-6.0	0.06-0.15	4.5-5.5	Low----------	0.37	3	.5-1
	4-39	35-50	0.2-0.6	0.12-0.18	3.6-5.5	Moderate-------	0.28		
	39-80	---	---	---	---	----------	----		
Smithdale-------	0-5	2-15	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28	5	.5-2
	5-42	18-33	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.24		
	42-72	12-27	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28		
21*, 22*:									
Montevallo------	0-7	7-27	0.6-2.0	0.09-0.18	4.5-6.0	Low----------	0.37	2	.5-2
	7-12	15-35	0.6-2.0	0.02-0.12	4.5-6.0	Low----------	0.32		
	12-20	---	---	---	---	----------	----		
Nauvoo----------	0-17	10-20	2.0-6.0	0.13-0.17	4.5-5.5	Low----------	0.28	3	.5-2
	17-35	18-35	0.6-2.0	0.14-0.20	4.5-5.5	Low----------	0.32		
	35-41	15-30	0.6-2.0	0.11-0.17	4.5-5.5	Low----------	0.32		
	41-60	---	---	---	---	----------	----		
23----------	0-17	10-20	2.0-6.0	0.13-0.17	4.5-5.5	Low----------	0.28	3	.5-2
Nauvoo	17-35	18-35	0.6-2.0	0.14-0.20	4.5-5.5	Low----------	0.32		
	35-41	15-30	0.6-2.0	0.11-0.17	4.5-5.5	Low----------	0.32		
	41-60	---	---	---	---	----------	----		
24----------	0-23	7-27	2.0-6.0	0.04-0.10	3.6-5.5	Low----------	0.24	5	<.5
Palmerdale	23-80	10-35	2.0-6.0	0.04-0.10	3.6-5.5	Low----------	0.24		
25----------	0-5	10-35	2.0-6.0	0.04-0.10	3.6-5.5	Low----------	0.24	5	<.5
Palmerdale	5-80	10-35	2.0-6.0	0.04-0.10	3.6-5.5	Low----------	0.24		
26*									
Pits.									
27, 28----------	0-3	5-20	0.6-2.0	0.09-0.16	4.5-6.5	Low----------	0.32	5	.5-2
Ruston	3-51	18-35	0.6-2.0	0.12-0.17	4.5-6.0	Low----------	0.28		
	51-81	15-38	0.6-2.0	0.12-0.17	4.5-6.0	Low----------	0.28		
29, 30----------	0-7	5-20	0.6-2.0	0.18-0.22	5.1-6.5	Low----------	0.37	3	.5-2
Shatta	7-28	18-30	0.2-0.6	0.18-0.22	4.5-6.0	Low----------	0.37		
	28-60	15-30	0.06-0.2	0.08-0.12	4.5-5.5	Low----------	0.37		
31*, 32*:									
Shatta----------	0-7	5-20	0.6-2.0	0.18-0.22	5.1-6.5	Low----------	0.37	3	.5-2
	7-28	18-30	0.2-0.6	0.18-0.22	4.5-6.0	Low----------	0.37		
	28-60	15-30	0.06-0.2	0.08-0.12	4.5-5.5	Low----------	0.37		
Urban land.									

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Clay <2mm	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
							K	T	
	In	Pct	In/hr	In/in	pH				Pct
33, 34----------	0-5	2-15	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28	5	.5-2
Smithdale	5-42	18-33	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.24		
	42-72	12-27	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28		
35*:									
Smithdale-------	0-5	2-15	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28	5	.5-2
	5-42	18-33	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.24		
	42-72	12-27	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28		
Flomaton--------	0-27	1-10	6.0-20	0.01-0.05	4.5-6.0	Very low-------	0.15	5	<.5
	27-72	1-10	6.0-20	0.02-0.07	4.5-6.0	Very low-------	0.17		
36*:									
Smithdale-------	0-5	2-15	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28	5	.5-2
	5-42	18-33	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.24		
	42-72	12-27	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28		
Luverne---------	0-4	7-20	2.0-6.0	0.06-0.15	4.5-5.5	Low----------	0.37	3	.5-1
	4-39	35-50	0.2-0.6	0.12-0.18	3.6-5.5	Moderate-------	0.28		
	39-80	---	---	---	---	----------	----		
37*:									
Smithdale-------	0-5	2-15	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28	5	.5-2
	5-42	18-33	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.24		
	42-72	12-27	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28		
Urban land.									
38*----------	0-5	2-15	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28	5	.5-2
Smithdale	5-42	18-33	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.24		
	42-72	12-27	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28		
39*:									
Smithdale-------	0-5	2-15	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28	5	.5-2
	5-42	18-33	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.24		
	42-72	12-27	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28		
Luverne---------	0-4	7-20	2.0-6.0	0.06-0.15	4.5-5.5	Low----------	0.37	3	.5-1
	4-39	35-50	0.2-0.6	0.12-0.18	3.6-5.5	Moderate-------	0.28		
	39-80	---	---	---	---	----------	----		
40*:									
Smithdale-------	0-5	2-15	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28	5	.5-2
	5-42	18-33	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.24		
	42-72	12-27	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28		
Pikeville-------	0-16	6-15	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.24	4	.5-2
	16-25	18-35	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.37		
	25-31	18-35	2.0-6.0	0.05-0.10	4.5-5.5	Low----------	0.10		
	31-72	16-32	2.0-6.0	0.04-0.08	4.5-5.5	Low----------	0.10		
41*									
Urban land.									

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--SOIL AND WATER FEATURES

[See text for definitions of terms such as "rare," "brief," "apparent," and "perched." The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern]

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			
2----- Adaton	D	Rare-----	---	---	0-0.5	Apparent	Jan-Apr	>60	---	High-----	High.
3*:											
Allen-----	B	None-----	---	---	>6.0	---	---	>60	---	Low-----	Moderate.
Bodine-----	B	None-----	---	---	>6.0	---	---	>60	---	Low-----	High.
4*:											
Augusta-----	C	Frequent----	Brief-----	Jan-May	1.0-2.0	Apparent	Jan-May	>60	---	High-----	Moderate.
Amy-----	D	Frequent----	Brief to very long.	Dec-May	0-1.0	Perched	Dec-Apr	>60	---	High-----	Moderate.
5, 6----- Bama	B	None-----	---	---	>6.0	---	---	>60	---	Low-----	Moderate.
7*, 8*:											
Bama-----	B	None-----	---	---	>6.0	---	---	>60	---	Low-----	Moderate.
Urban land.											
9*----- Bibb	C	Frequent----	Brief-----	Dec-May	0.5-1.5	Apparent	Dec-Apr	>60	---	High-----	Moderate.
10*:											
Bodine-----	B	None-----	---	---	>6.0	---	---	>60	---	Low-----	High.
Allen-----	B	None-----	---	---	>6.0	---	---	>60	---	Low-----	Moderate.
11----- Boswell	D	None-----	---	---	>6.0	---	---	>60	---	High-----	Moderate.
12----- Brilliant	B	None-----	---	---	>6.0	---	---	>60	---	Low-----	Low.
13----- Cahaba	B	Rare-----	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
14----- Choccolocco	B	Rare-----	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
15----- Decatur	B	None-----	---	---	>6.0	---	---	>60	---	High-----	Moderate.
16----- Dundee	C	Rare-----	---	---	1.5-3.5	Apparent	Jan-Apr	>60	---	High-----	Moderate.
17----- Ellisville	B	Frequent----	Very brief	Nov-Mar	>6.0	---	---	>60	---	Moderate	Moderate.
18----- Falkner	C	None-----	---	---	1.5-2.5	Perched	Jan-Mar	>60	---	High-----	Moderate.
19*:											
Iuka-----	C	Frequent----	Very brief to brief.	Dec-Apr	1.0-3.0	Apparent	Dec-Apr	>60	---	Moderate	High.
Mantachie-----	C	Frequent----	Brief-----	Jan-Mar	1.0-1.5	Apparent	Dec-Mar	>60	---	High-----	High.
20*:											
Luverne-----	C	None-----	---	---	>6.0	---	---	>60	---	High-----	High.
Smithdale-----	B	None-----	---	---	>6.0	---	---	>60	---	Low-----	Moderate.

See footnote at end of table.

TABLE 15.--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*, 22*: Montevallo	D	None	---	---	>6.0	---	---	10-20	Soft	Moderate	Moderate.
Nauvoo	B	None	---	---	>6.0	---	---	40-60	Soft	Low	High.
23--- Nauvoo	B	None	---	---	>6.0	---	---	40-60	Soft	Low	High.
24, 25--- Palmerdale	B	None	---	---	>6.0	---	---	>60	---	Moderate	High.
26* Pits.											
27, 28--- Ruston	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
29, 30--- Shatta	C	None	---	---	1.5-3.0	Perched	Dec-Jun	>60	---	Moderate	Moderate.
31*, 32*: Shatta	C	None	---	---	1.5-3.0	Perched	Dec-Jun	>60	---	Moderate	Moderate.
Urban land.											
33, 34--- Smithdale	B	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
35*: Smithdale	B	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
Flomaton	A	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
36*: Smithdale	B	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
Luverne	C	None	---	---	>6.0	---	---	>60	---	High	High.
37*: Smithdale	B	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
Urban land.											
38*--- Smithdale	B	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
39*: Smithdale	B	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
Luverne	C	None	---	---	>6.0	---	---	>60	---	High	High.
40*: Smithdale	B	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
Pikeville	B	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
41* Urban land.											

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--PHYSICAL ANALYSIS OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Particle-size distribution (Percent less than 2.0 mm)		
			Sand (2.0-0.05 mm)	Silt (0.05-0.002 mm)	Clay (0.002 mm)
	In				
Adaton:					
S77AL-125-8-1	0-2	Ap	19.1	54.0	26.9
S77AL-125-8-2	2-7	A2	13.4	62.2	24.4
S77AL-125-8-3	7-20	B21tg	17.3	59.8	22.9
S77AL-125-8-4	20-31	B22tg	19.9	54.6	25.5
S77AL-125-8-5	31-46	B23tg	14.7	53.5	31.8
S77AL-125-8-6	46-58	B24tg	9.7	60.1	30.2
S77AL-125-8-7	58-79	B25tg	13.7	53.2	33.1
Amy:					
S77AL-125-10-1	0-5	A1	19.9	63.1	17.0
S77AL-125-10-2	5-14	A2g	29.6	53.5	16.9
S77AL-125-10-3	14-31	B21tg	18.0	56.5	25.5
S77AL-125-10-4	31-48	B22tg	17.1	54.3	28.6
S77AL-125-10-5	48-60	Cg	46.0	42.3	11.7
S77AL-125-10-6	60-72	IICg	70.0	19.2	10.8
Augusta:					
S77AL-125-9-1	0-5	A1	37.0	41.5	21.5
S77AL-125-9-2	5-9	A2	34.8	43.9	21.3
S77AL-125-9-3	9-24	B21t	36.3	36.3	27.4
S77AL-125-9-4	24-35	B22tg	23.2	34.3	42.5
S77AL-125-9-5	35-59	B3g	21.2	34.1	44.7
S77AL-125-9-6	59-72	IIC	71.6	16.0	12.4
Bama:					
S77AL-125-5-1	0-5	Ap	60.3	23.6	16.1
S77AL-125-5-2	5-18	B21t	41.9	30.7	27.4
S77AL-125-5-3	18-30	B22t	46.1	25.9	28.0
S77AL-125-5-4	30-54	B23t	47.8	28.2	24.0
S77AL-125-5-5	54-61	B24t	56.2	18.8	25.0
Boswell:					
S77AL-125-7-1	0-4	Ap	34.7	43.9	21.4
S77AL-125-7-2	4-15	B21t	5.2	39.0	55.8
S77AL-125-7-3	15-26	B22t	2.1	38.7	59.2
S77AL-125-7-4	26-34	B23t	1.5	31.0	67.5
S77AL-125-7-5	34-70	B24t	2.0	20.6	77.4
S77AL-125-7-6	70-75	C	2.9	18.7	78.4
Dundee*:					
S78AL-125-1-1	0-3	Ap	13.2	73.8	13.0
S78AL-125-1-2	3-13	A12	17.2	69.6	13.2
S78AL-125-1-3	13-24	B21t	12.9	61.4	25.7
S78AL-125-1-4	24-36	B22t	14.4	64.4	21.2
S78AL-125-1-5	36-58	B3g	13.5	57.4	29.1
S78AL-125-1-6	58-72	Cg	7.6	63.0	29.4
Dundee:					
S79AL-125-1-1	0-4	Ap	16.9	61.8	21.3
S79AL-125-1-2	4-10	A2	13.7	62.6	23.7
S79AL-125-1-3	10-16	B21t	15.9	57.1	27.0
S79AL-125-1-4	16-22	B22tg	16.8	55.8	27.4
S79AL-125-1-5	22-41	B23tg	14.3	51.8	34.2
S79AL-125-1-6	41-59	B24tg	11.4	53.5	35.1
S79AL-125-1-7	59-80	Cg	6.3	60.7	33.0
Falkner:					
S77AL-125-12-2	3-12	A2	16.2	69.2	14.6
S77AL-125-12-3	12-18	B21t	7.4	59.2	33.4
S77AL-125-12-4	18-39	B22t	15.9	50.0	34.1
S77AL-125-12-5	39-63	B23t	18.4	53.6	28.0
S77AL-125-12-6	63-86	C1	17.0	58.2	24.8

See footnote at end of table.

TABLE 16.--PHYSICAL ANALYSIS OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution (Percent less than 2.0 mm)		
			Sand (2.0-0.05 mm)	Silt (0.05-0.002 mm)	Clay (0.002 mm)
	In				
Luverne:					
S77AL-125-6-1	0-4	Ap	79.5	10.6	9.9
S77AL-125-6-2	4-14	B21t	39.7	10.1	50.2
S77AL-125-6-3	14-24	B22t	54.7	10.1	35.2
S77AL-125-6-4	24-39	B23t	32.2	19.3	48.5
S77AL-125-6-5	39-50	C1	52.1	13.7	34.2
Smithdale:					
S77AL-125-11-1	0-5	Ap	68.0	29.2	2.8
S77AL-125-11-2	5-20	B21t	42.9	34.9	22.2
S77AL-125-11-3	20-42	B22t	50.7	29.1	20.2
S77AL-125-11-4	42-52	B23t	61.2	26.5	12.3
S77AL-125-11-5	52-72	B24t	66.0	12.8	21.2

* Sand content is slightly lower than allowed in the range for the Dundee series. This is, however, within the normal sampling and analysis error.

TABLE 17.--CHEMICAL ANALYSIS OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Extractable bases			Extractable acidity	Base saturation	Reaction	Cation exchange capacity
			Ca	Mg	K				
			Meg/100g				Pct	pH	
Adaton:									
S77AL-125-8-1	0-2	Ap	3.28	1.44	0.32	7.68	40	4.6	12.72
S77AL-125-8-2	2-7	A2	2.82	0.91	0.15	6.32	38	4.9	10.21
S77AL-125-8-3	7-20	B21tg	2.14	1.08	0.10	4.08	45	5.1	7.40
S77AL-125-8-4	20-31	B22tg	1.60	1.77	0.15	4.16	46	5.2	7.68
S77AL-125-8-5	31-46	B23tg	0.34	2.13	0.10	7.20	26	4.8	9.77
S77AL-125-8-7	58-79	B25tg	0.20	3.77	0.15	5.84	41	4.8	9.96
Amy*:									
S77AL-125-10-1	0-5	A1	2.92	1.09	0.22	2.40	64	4.1	6.62
S77AL-125-10-2	5-14	A2g	1.00	0.85	0.12	5.04	28	4.2	7.01
S77AL-125-10-3	14-31	B21tg	0.98	1.08	0.05	6.24	25	4.3	8.35
S77AL-125-10-4	31-48	B22tg	0.88	1.04	0.05	6.96	22	4.3	8.94
S77AL-125-10-5	48-60	Cg	0.22	0.65	0.04	6.24	13	4.3	7.15
S77AL-125-10-6	60-72	IICg	0.22	0.55	0.06	5.92	12	4.4	6.75
Augusta*:									
S77AL-125-9-1	0-5	A1	1.04	0.98	0.21	7.36	23	4.4	9.59
S77AL-125-9-2	5-9	A2	0.76	0.95	0.32	5.36	28	4.4	7.39
S77AL-125-9-3	9-24	B21t	1.06	1.27	0.09	6.08	29	4.6	8.51
S77AL-125-9-4	24-35	B22tg	1.22	1.70	0.12	7.52	29	4.6	10.56
S77AL-125-9-5	35-59	B3g	0.98	1.60	0.12	9.04	23	4.5	11.74
S77AL-125-9-6	59-72	IIC	0.60	1.27	0.08	2.48	44	5.0	4.44
Bama:									
S77AL-125-5-1	0-5	Ap	1.12	0.39	0.13	2.48	40	5.0	4.12
S77AL-125-5-2	5-18	B21t	1.52	0.68	0.10	4.64	33	4.8	6.95
S77AL-125-5-3	18-30	B22t	0.14	1.50	0.11	4.00	31	4.6	5.76
S77AL-125-5-4	30-54	B23t	0.14	0.72	0.10	3.60	21	4.8	4.56
S77AL-125-5-5	54-61	B24t	0.12	0.55	0.07	4.64	14	4.6	5.38
Boswell*:									
S77AL-125-7-1	0-4	Ap	1.90	0.75	0.18	3.68	44	4.9	6.51
S77AL-125-7-2	4-15	B21t	1.84	0.81	0.16	5.68	33	4.3	8.50
S77AL-125-7-3	15-26	B22t	1.26	0.68	0.16	7.44	22	4.0	9.55
S77AL-125-7-4	26-34	B23t	1.02	1.34	0.16	9.60	21	3.9	12.12
S77AL-125-7-5	34-70	B24t	1.42	2.63	0.12	4.80	47	3.9	8.98
S77AL-125-7-6	70-75	C	1.68	2.88	0.16	8.32	36	3.7	13.04
Dundee:									
S78AL-125-1-1	0-3	Ap	4.84	1.24	0.32	3.92	62	5.7	10.33
S78AL-125-1-2	3-13	A12	4.50	0.81	0.10	4.32	56	5.4	9.74
S78AL-125-1-3	13-24	B21t	1.18	1.31	0.06	4.72	35	5.2	7.27
S78AL-125-1-4	24-36	B22t	0.82	1.54	0.06	5.44	31	5.3	7.86
S78AL-125-1-5	36-58	B3g	0.20	1.73	0.07	6.00	25	5.2	8.00
S78AL-125-1-6	58-72	Cg	1.06	2.70	0.28	5.20	44	5.1	9.24
Dundee:									
S79AL-125-1-1	0-4	Ap	6.82	0.98	0.17	2.32	77	5.8	10.30
S79AL-125-1-2	4-10	A2	3.86	0.72	0.06	3.12	60	5.5	7.77
S79AL-125-1-3	10-16	B21t	0.44	0.83	0.05	6.72	16	4.8	8.04
S79AL-125-1-4	16-22	B22tg	0.32	0.79	0.05	5.36	18	4.9	6.52
S79AL-125-1-5	22-41	B23tg	0.22	1.42	0.05	7.44	17	5.3	9.14
S79AL-125-1-6	41-59	B24tg	0.26	1.92	0.06	6.24	27	5.4	8.49
S79AL-125-1-7	59-80	Cg	0.88	3.05	0.07	6.00	40	5.4	10.01
Falkner:									
S77AL-125-12-1	0-3	Ap	5.66	2.22	0.54	4.32	66	5.3	12.75
S77AL-125-12-2	3-12	A2	3.02	1.19	0.10	5.84	43	5.2	10.15
S77AL-125-12-3	12-18	B21t	1.16	1.31	0.08	7.92	24	5.0	10.47
S77AL-125-12-4	18-39	B22t	0.34	1.31	0.08	6.24	22	5.3	7.97
S77AL-125-12-5	39-63	B23t	0.22	3.01	0.10	5.92	36	5.4	9.25
S77AL-125-12-6	63-86	C1	0.12	3.73	0.11	5.04	44	5.4	9.01

See footnote at end of table.

TABLE 17.--CHEMICAL ANALYSIS OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Extractable bases			Extractable acidity	Base saturation	Reaction	Cation exchange capacity
			Ca	Mg	K				
			Meg/100g				Pct	pH	
Luverne:									
S77AL-125-6-1	0-4	Ap	1.40	0.62	0.19	2.56	46	5.2	4.77
S77AL-125-6-2	4-14	B21t	0.52	2.81	0.25	9.44	28	4.6	13.03
S77AL-125-6-3	14-24	B22t	0.22	2.09	0.21	8.00	24	4.6	10.53
S77AL-125-6-4	24-39	B23t	0.18	2.39	0.32	20.72	12	4.5	23.62
S77AL-125-6-5	39-50	C1	0.10	1.34	0.27	13.28	11	4.4	15.00
Smithdale:									
S77AL-125-11-1	0-5	Ap	1.00	0.39	0.10	2.16	41	5.1	3.65
S77AL-125-11-2	5-20	B21t	1.15	1.01	0.13	6.72	26	4.7	9.02
S77AL-125-11-3	20-42	B22t	0.50	0.95	0.07	3.84	28	4.7	5.36
S77AL-125-11-4	42-52	B23t	0.40	0.49	0.05	3.12	23	4.7	4.06
S77AL-125-11-5	52-72	B24t	0.06	0.55	0.05	2.32	34	4.7	3.52

* Data indicates very low pH which is contradictory to the field determination. Oxidation of sulfides before laboratory processing begins probably accounts for this discrepancy.

TABLE 18.--ENGINEERING INDEX TEST DATA

[Dashes indicate data were not available. NP means nonplastic]

Soil name, report number, horizon, and depth in inches	Classification		Grain-size distribution										Liquid limit	Plasticity index	Moisture density	
			Percentage passing sieve--							Percentage smaller than--						
	AASHTO	Unified	2 inch	3/4 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm			Max. dry density	Optimum moisture
													Pct		Lb/Ft^3	Pct
Bama fine sandy loam:[1] (S78AL-125-004)																
Ap------- 0 to 5	A-4 (00)	ML	100	100	100	99	99	95	51	--	--	--	--	NP	112	13
B22t-----18 to 30	A-6 (03)	CL	100	100	100	99	99	95	53	--	--	--	31	11	115	13
Boswell loam:[2] (S78AL-125-007)																
Ap------- 0 to 4	A-4 (05)	ML	100	--	--	99	99	97	84	--	--	--	33	6	99	18
B23t-----26 to 34	A-7-6(39)	CH	100	100	100	100	100	100	99	--	--	--	60	33	96	16
Luverne fine sandy loam:[3] (S78AL-125-002)																
Ap------- 0 to 2	A-2-4(00)	SM	100	100	100	78	68	65	20	--	--	--	--	NP	99	18
B22t-----14 to 24	A-7-5(13)	MH	100	100	100	98	98	96	62	--	--	--	55	22	96	22
C2-------50 to 80	A-7-5(10)	ML	100	100	100	100	99	98	62	--	--	--	49	18	95	20
Smithdale fine sandy loam:[4] (S78AL-125-003)																
Ap------- 0 to 5	A-2-4(00)	SM	100	100	100	99	98	94	29	--	--	--	--	NP	111	11
B21t----- 5 to 20	A-6 (06)	CL	100	100	100	99	98	96	56	--	--	--	38	16	107	16
B24t-----52 to 72	A-4 (00)	SM-SC	100	100	100	99	98	95	36	--	--	--	22	5	121	11

[1]Bama fine sandy loam:
20 feet north and 1,837 feet west of the southeast corner of sec. 16, T. 20 S., R. 10 W.
[2]Boswell loam:
935 feet north and 750 feet east of the southwest corner of sec. 10, T. 22 S., R. 9 W.
[3]Luverne fine sandy loam:
835 feet north and 2,608 feet west of the southeast corner of sec. 11, T. 22 S., R. 9 W.
[4]Smithdale fine sandy loam:
2,000 feet north and 1,840 feet east of the southwest corner of sec. 17, T. 20 S., R. 9 W.

TABLE 19.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Adaton	Fine-silty, mixed, thermic Typic Ochraqualfs
Allen	Fine-loamy, siliceous, thermic Typic Paleudults
Amy	Fine-silty, siliceous, thermic Typic Ochraquults
Augusta	Fine-loamy, mixed, thermic Aeric Ochraquults
Bama	Fine-loamy, siliceous, thermic Typic Paleudults
Bibb	Coarse-loamy, siliceous, acid, thermic Typic Fluvaquents
Bodine	Loamy-skeletal, siliceous, thermic Typic Paleudults
Boswell	Fine, mixed, thermic Vertic Paleudalfs
Brilliant	Loamy-skeletal, mixed, nonacid, thermic Typic Udorthents
Cahaba	Fine-loamy, siliceous, thermic Typic Hapludults
Choccolocco	Fine-silty, mixed, thermic Typic Hapludults
Decatur	Clayey, kaolinitic, thermic Rhodic Paleudults
Dundee	Fine-silty, mixed, thermic Aeric Ochraqualfs
Ellisville	Fine-silty, mixed, thermic Dystric Fluventic Eutrochrepts
Falkner	Fine-silty, siliceous, thermic Aquic Paleudalfs
Flomaton	Sandy-skeletal, siliceous, thermic Psammentic Paleudults
Iuka	Coarse-loamy, siliceous, acid, thermic Aquic Udifluvents
Luverne	Clayey, mixed, thermic Typic Hapludults
Mantachie	Fine-loamy, siliceous, acid, thermic Aeric Fluvaquents
Montevallo	Loamy-skeletal, mixed, thermic, shallow Typic Dystrochrepts
Nauvoo	Fine-loamy, siliceous, thermic Typic Hapludults
Palmerdale	Loamy-skeletal, mixed, acid, thermic Typic Udorthents
Pikeville	Fine-loamy, siliceous, thermic Typic Paleudults
Ruston	Fine-loamy, siliceous, thermic Typic Paleudults
Shatta	Fine-silty, siliceous, thermic Typic Fragiudults
Smithdale	Fine-loamy, siliceous, thermic Typic Paleudults

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