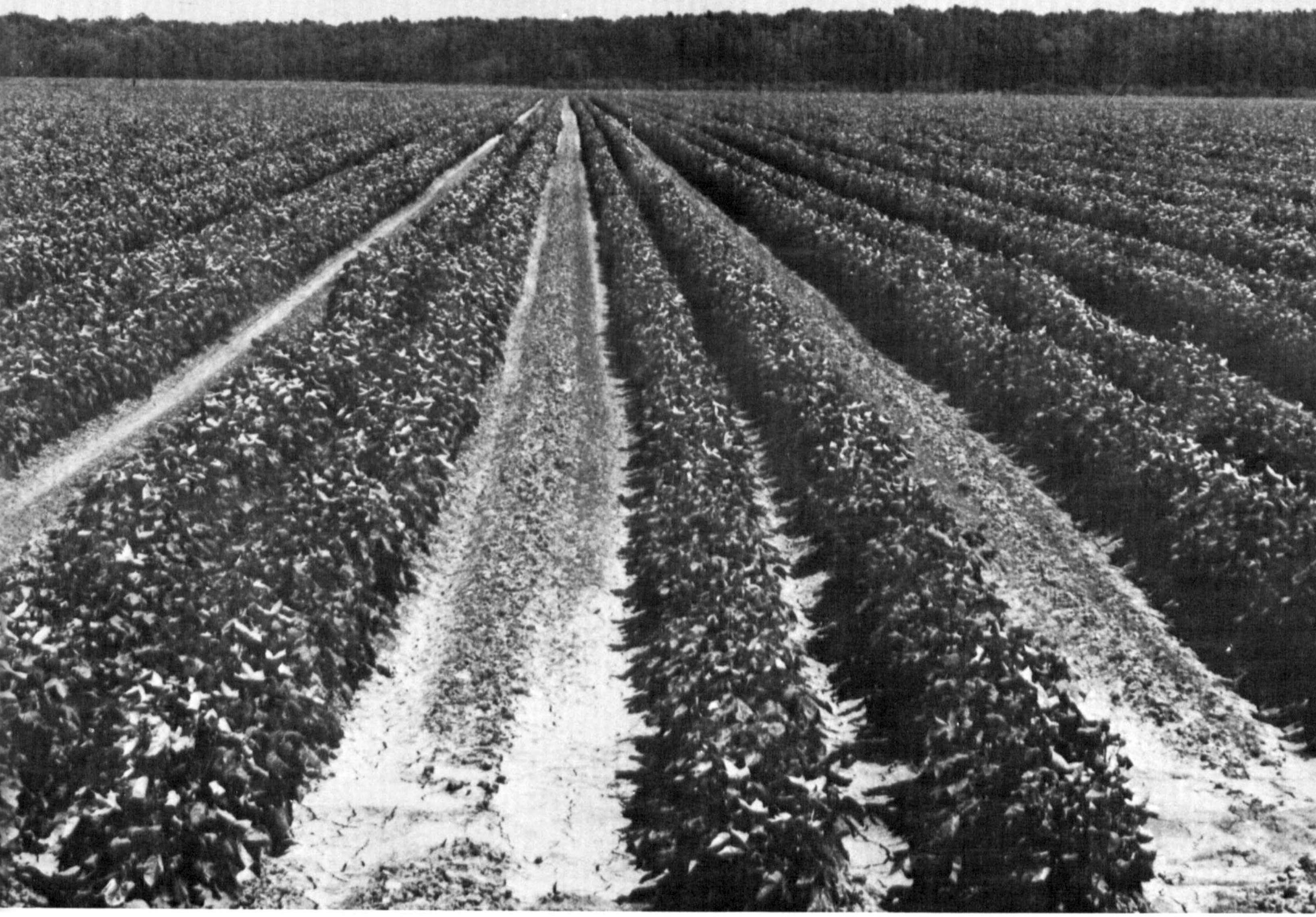
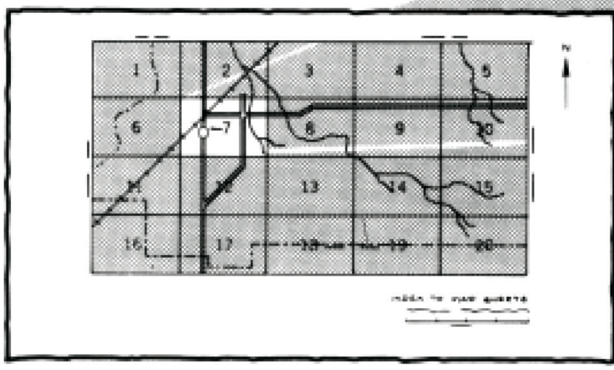
Soil Survey of
Lonoke and Prairie Counties Arkansas

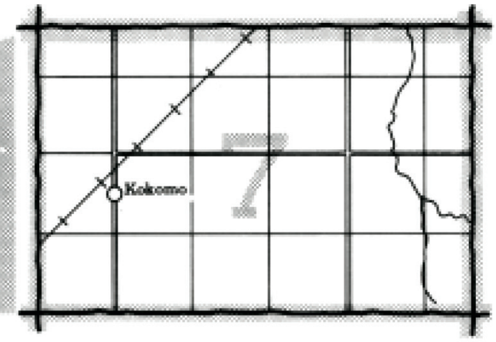


United States Department of Agriculture, Soil Conservation Service
In cooperation with
Arkansas Agricultural Experiment Station

HOW TO USE

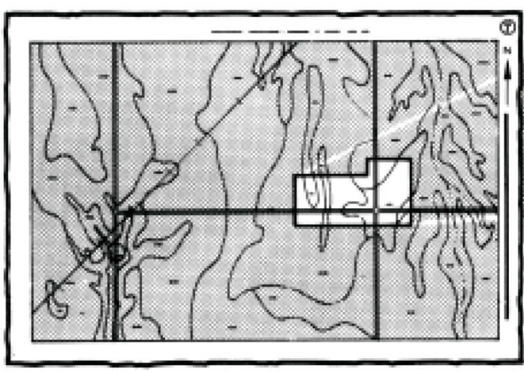
1. Locate your area of interest on the "Index to Map Sheets"

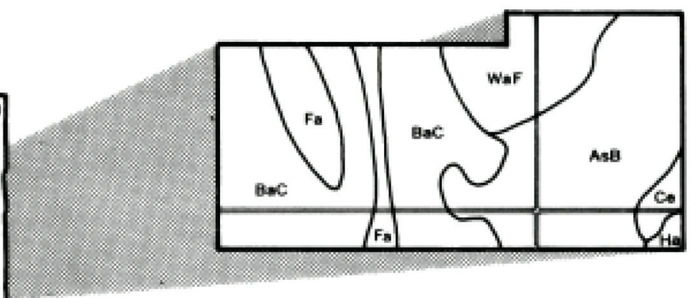




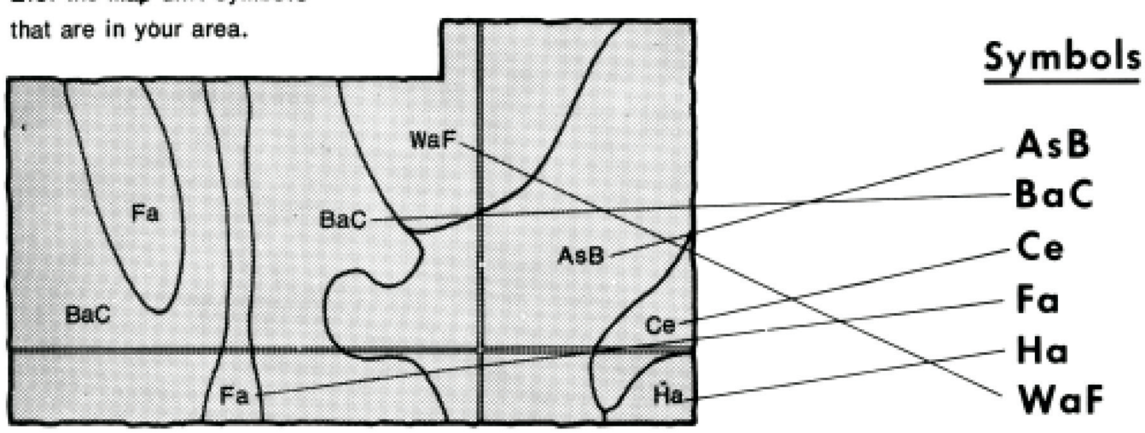
2. Note the number of the map sheet and turn to that sheet.

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



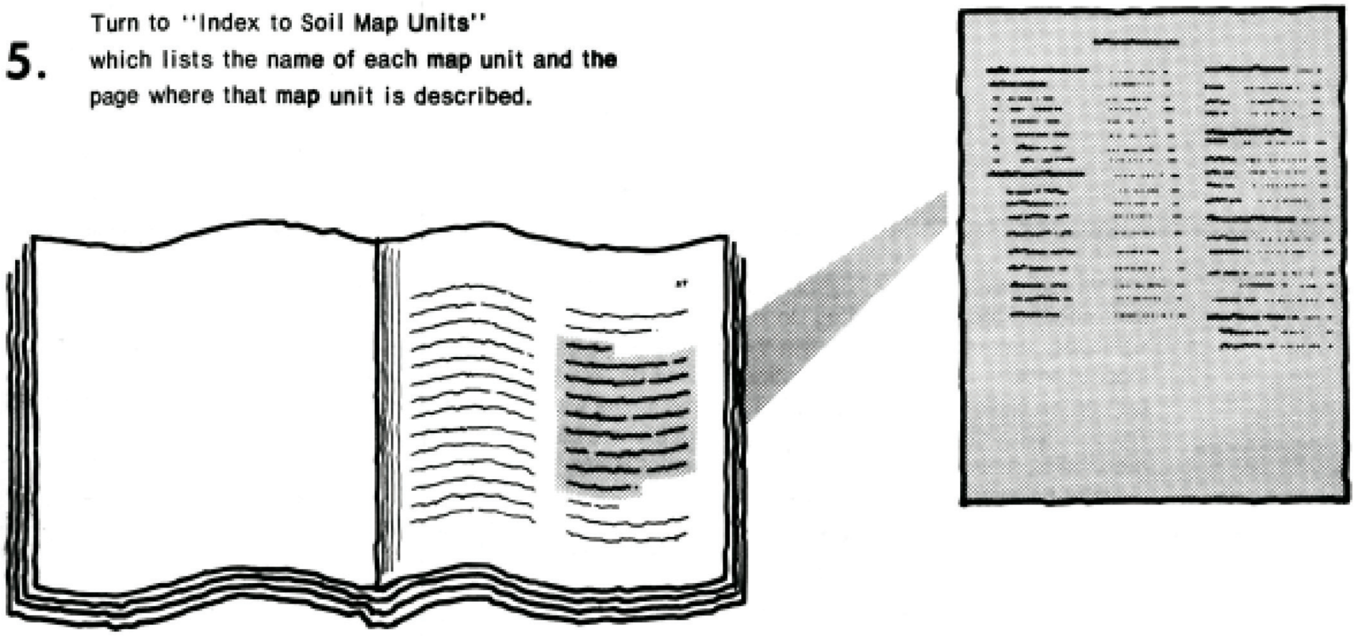


4. List the map unit symbols that are in your area.

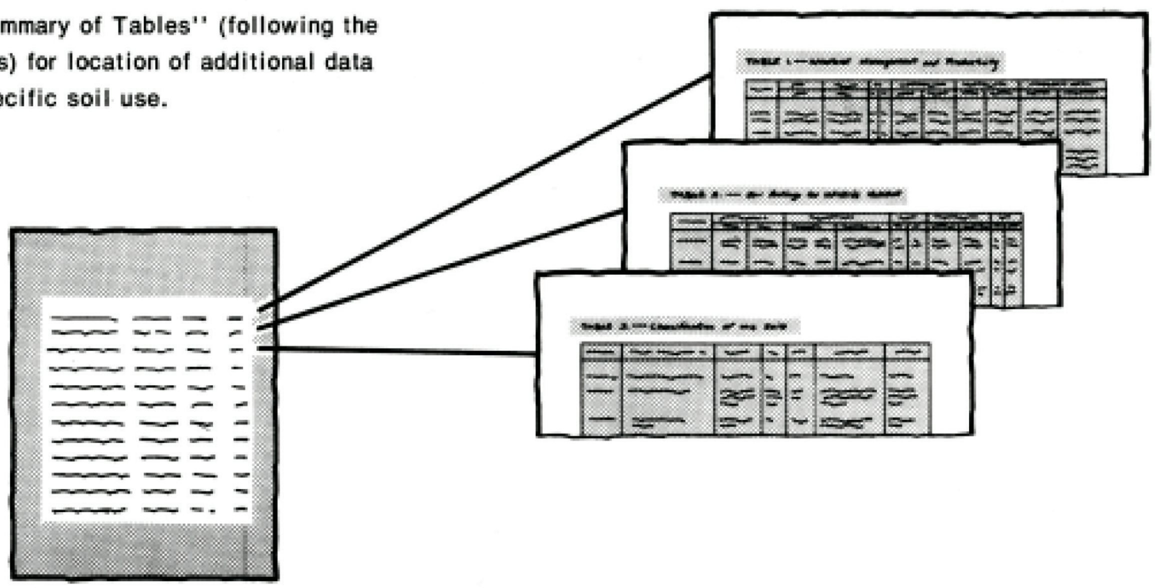


THIS SOIL SURVEY

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 1975-79. Soil names and descriptions were approved in 1980. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1979. This survey was made cooperatively by the Soil Conservation Service and the Arkansas Agricultural Experiment Station. It is part of the technical assistance furnished to the Lonoke County Conservation District and the Prairie County Conservation District.

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

This survey supersedes the soil survey of Lonoke County published in 1926 (*4*) and the soil survey of Prairie County published in 1908 (*3*).

Cover: The economy of Prairie and Lonoke Counties is based primarily on highly diversified agriculture. A major crop is cotton, shown here growing on Rilla silt loam, 0 to 1 percent slopes.

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soil series

Issued October 1981

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foreword

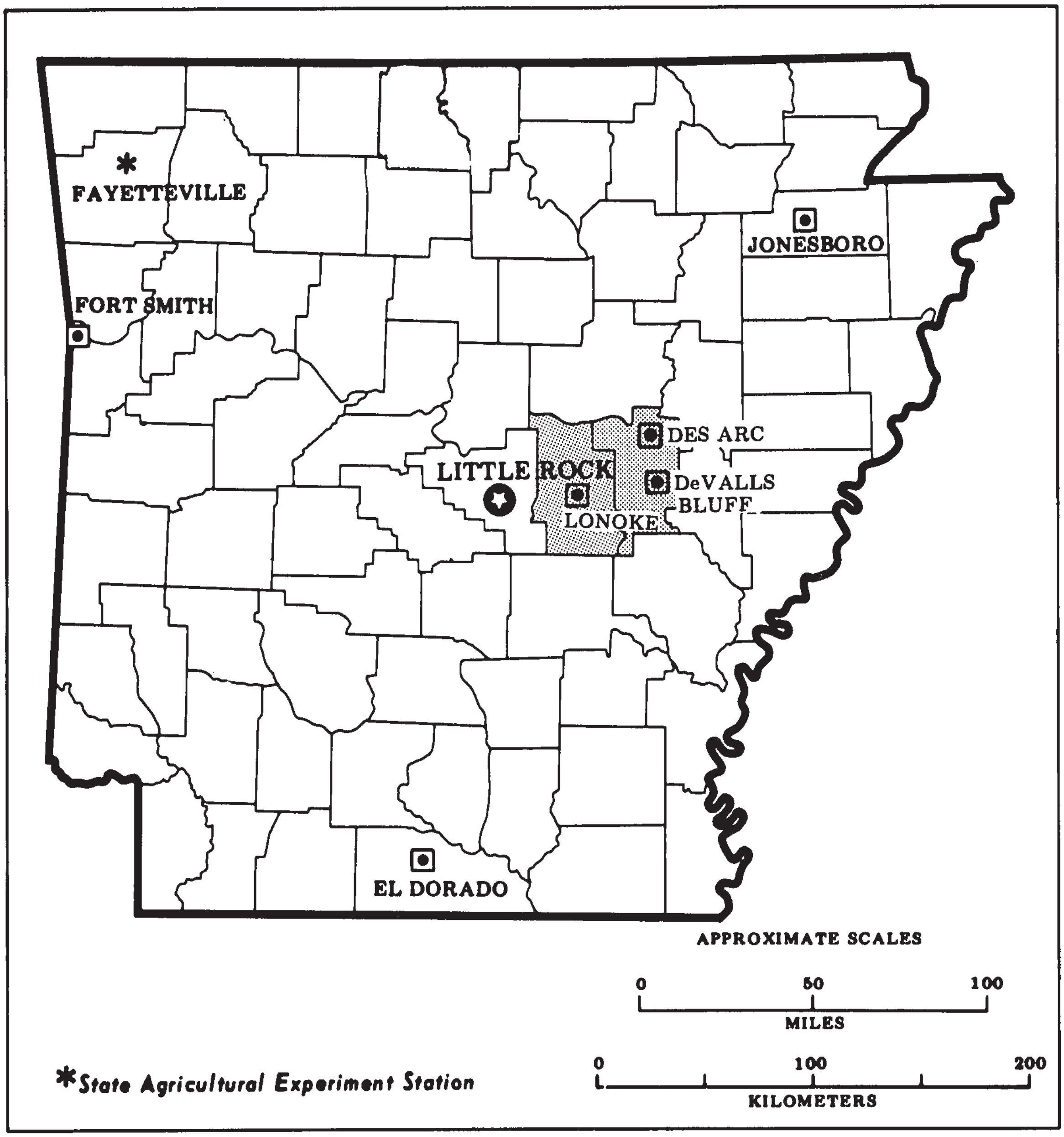
This soil survey contains information that can be used in land-planning programs in Lonoke and Prairie Counties. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and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

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

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

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

Jack C. Davis
State Conservationist
Soil Conservation Service



Location of Lonoke and Prairie Counties in Arkansas.

soil survey of
Lonoke and Prairie Counties Arkansas

By Richard T. Fielder, Kenneth J. Crader, Marcella A. Simon, and Curtis R. Wilson
Soil Conservation Service

United States Department of Agriculture
Soil Conservation Service
in cooperation with the
Arkansas Agricultural Experiment Station

LONOKE AND PRAIRIE COUNTIES adjoin one another in the central part of Arkansas.

Lonoke County is roughly rectangular in shape. It runs about 40 miles from north to south and about 24 miles from east to west. Lonoke County has a total area of about 512,640 acres, or about 801 square miles, which includes 3,264 acres of large bodies of water. The total land area is about 509,376 acres. The county is bounded on the north by White County, on the south by Jefferson and Arkansas Counties, on the east by Prairie County, and on the west by Pulaski and Faulkner Counties.

In 1970 the population of Lonoke County was 26,249. Lonoke, with a population of 3,140, is the county seat. Other important trading centers are Cabot, with a population of 3,503; England, with a population of 3,075; and Carlisle, with a population of 2,048.

The economy of Lonoke County is based primarily on farming. Except for a few manufacturing plants in Cabot, England, and Lonoke, the local businesses provide agricultural services. Urban expansion is proceeding most rapidly in the Cabot area.

Prairie County is roughly rectangular in shape. It runs about 40 miles from north to south and about 20 miles from east to west. Prairie County has a total area of about 435,840 acres, or about 681 square miles, which includes 12,992 acres of large bodies of water. The total land area is about 422,848 acres. The county is bounded on the north by White and Woodruff Counties, on the south by Arkansas County, on the east by Woodruff and Monroe Counties, and on the west by Lonoke County.

In 1970 the population of Prairie County was 10,249. Des Arc, with a population of 2,121, and DeValls Bluff, with a population of 655, are the county seats. Hazen, with a population of 1,597, is also an important trading center.

The economy of Prairie County is based primarily on farming. Except for a few manufacturing plants, the local businesses provide agricultural services.

general nature of the survey area

This section describes, in a general way, how the land is used, and in more detail, farming, physiography and drainage, and climate in Lonoke and Prairie Counties. Statistics on farming are from the 1974 Census of Agriculture.

The soils of Lonoke County formed in a variety of sediments. In the southern part of the county, the soils formed in loamy and clayey sediments on bottom lands, mainly those of the Arkansas River and its tributaries. These soils make up about 42 percent of Lonoke County. They contain moderate to high amounts of plant nutrients. In nearly all of this bottom land area the soils are cultivated. In some places they are used as wildlife habitat. Excess water drains away slowly, and wetness is a moderate to severe limitation in most of the area. Erosion is a significant hazard in a few places.

The soils in the central part of the county formed in loamy windblown sediment and in loamy sediment underlain by clayey alluvium. These soils are on the Loess Plains and Terraces and make up about 29 percent of Lonoke County. They contain moderate amounts of plant nutrients. In nearly all of this area the soils are cultivated. In a few places they are used as wildlife habitat. Excess water drains away slowly, and wetness is a moderate to severe limitation in most of the area. Erosion is a significant hazard in a few places.

The soils in the northern part of Lonoke County are on uplands and their associated flood plains. These soils make up about 29 percent of Lonoke County. Frequent flooding on the flood plains limits their use, and most are forested. These soils formed in several different kinds of sediment. The soils in the eastern part of the upland area or northeastern part of the county formed mainly in windblown sediment. The soils in the southwestern part of the upland area formed mainly in older loamy and clayey sediments laid down in a former shallow sea. The soils in the northwestern part of the upland area and extreme northwestern part of the county formed in loamy and clayey residuum of interbedded sandstone and shale. Generally, the soils that formed in the eastern part of the upland area contain moderate amounts of plant nutrients and those soils in the western part contain low amounts. The upland soils are best suited to pasture and woodland. Excess water is a moderate to severe hazard on the level tracts, and erosion is a moderate to very severe hazard on the sloping area.

Elevation in Lonoke County ranges from about 500 feet in the northwestern part of the county to about 185 feet in the southeastern part. Elevation decreases toward the south and southeast.

The soils of Prairie County formed in a variety of sediments. Along the eastern side of the county are soils that formed in loamy and clayey sediments on bottom lands, mainly those of the White River and its tributaries. These soils make up about I9 percent of the county. In the extreme southwestern part of the county are soils that formed in clayey sediment on bottom lands, mainly of the Arkansas River and its tributaries. These soils make up about 2 percent of Prairie County. The soils on bottom lands contain moderate to high amounts of plant nutrients. In most of this bottom land area the soils are cultivated. In places they are used as wildlife habitat. Excess water drains away slowly or is ponded, and wetness is a moderate to severe hazard over most of the area. Flooding is common in many places. Erosion is a significant hazard in a few places.

The soils in the southern and north-central parts of the county formed in loamy windblown sediment underlain by clayey alluvium. These soils are on the Loess Plains and Terraces and make up about 59 percent of Prairie County. They contain moderate amounts of plant nutrients. In nearly all of this area the soils are cultivated. Excess water drains away slowly or is ponded and is a moderate to severe hazard over most of the area. Erosion is a significant hazard in a few places.

The soils in the northwestern and central parts of Prairie County are on uplands and their associated flood plains. These soils make up about 20 percent of the county. The soils in the upland area formed mainly in loamy windblown sediment. In most of the upland area the soils are used as pasture and woodland, but in a few places they are cultivated. The soils contain moderate amounts of plant nutrients. Excess water is a moderate to severe hazard on level tracts, and erosion is a moderate to very severe hazard on sloping areas.

Elevation in Prairie County ranges from about 265 feet in the northwestern part of the county to about 160 feet in the eastern part. Elevation decreases toward the east and south.

farming

Settlers came to Lonoke and Prairie Counties in the early 1800's. Many of them came from other Southern States, mainly the Carolinas, Georgia, Alabama, Kentucky, and Tennessee. When these settlers arrived, both counties were mostly covered by forest. A few areas were native prairies, which were treeless in general but had scattered trees along their borders. Settlers cleared a few acres of land, using the timber for fuel and construction of cabins. They grew small quantities of corn and vegetables for food. Game and fish were plentiful and supplied most of their meat.

Cotton growing was begun in the early 1840's. The acreage in cotton rapidly increased and cotton soon became the major crop of both counties. Prior to 1900, most of the native prairie land in both counties was used mainly for pasture and hay production. Rice was introduced in the early 1900's and has since become an important crop in both counties, especially in the prairie areas. Corn was also an important crop in both counties and was used mainly as feed for work stock. As farming became more and more mechanized, corn began to decline in importance. Soybeans were introduced in about 1950 and have since become a major crop in both counties. At present, soybeans and rice are the major crops grown in both counties. Cotton, wheat, oats, and hay are other important crops. Livestock and poultry production has also increased in importance in both counties.

In 1974 the Census of Agriculture reported that about 83 percent of Lonoke County and about 73 percent of Prairie County is in farms (*8*). The rest consists of extensive wooded tracts, cities, towns, and transportation and utility facilities. Farming has become more general, and soybeans, cotton, rice and other small grains, livestock, poultry, and truck crops are all important. Table 1 compares the acreage of principal crops and pasture in 1969 and 1974, and table 2 compares the number of livestock and poultry in the same years.

Farms in Lonoke and Prairie Counties, as in most of the state, are decreasing in number and increasing in size. Between 1969 and 1974, the number of farms decreased from 1,306 to 1,017 in Lonoke County and from 749 to 613 in Prairie County. During the same period, the average farm size increased from 332 acres to 416 acres in Lonoke County and from 442 acres to 506 acres in Prairie County.

Most farms are small enough for the family to do most of the work. Outside labor may be hired during peak seasons. The larger farms are operated by laborers who are supervised by the owner, manager, or tenant. Tenants pay a fixed rent or a percentage of the crop for use of the land. Most of the land is farmed by operators who have sufficient modern equipment to farm efficiently. Most farmers fertilize according to the needs of the crop and use chemicals for weed control.

physiography and drainage

The geologic deposits at the surface of Lonoke and Prairie Counties, except for a small area in the northwest corner of Lonoke County, are unconsolidated sediments laid down by water and wind. In the northwestern part of Lonoke County are ridges of interbedded sandstone and shale. Generally, Southern Mississippi Valley alluvium makes up the southern part of Lonoke County and the eastern part of Prairie County. Loess Hills and Terraces make up the northeastern part of Lonoke County and the northwestern and central parts of Prairie County. Loess Plains and Terraces are in the central part of Lonoke County and the central and southern parts of Prairie County. Southern Coastal Plains are in a small area in the north-central part of Lonoke County. Arkansas Valley Uplands are in a small area in the extreme northwestern part of Lonoke County.

Topographically, Lonoke and Prairie Counties can be divided into five main regions: the nearly level to level bottom lands, the nearly level to level Loess Plains and Terraces, the nearly level to moderately steep Loess Hills and Terraces, the level to moderately sloping Coastal Plains, and the nearly level to steep Arkansas Valley Uplands.

The topography of the bottom lands ranges from broad flats to natural levees that border abandoned stream channels. Local differences are generally less than 1 foot on the flats and range to 3 percent on side slopes of the natural levees. The major soils in this area are Perry, Portland, Hebert, Rilla, Kobel, Commerce, and Dubbs soils.

In the Loess Plains and Terraces region the topography ranges from broad flats to low ridges and flood plains along natural drains. Slopes are generally less than 1 percent but range to 8 percent on side slopes and low ridges. The major soils in this area are Calhoun, Calloway, Crowley, and Stuttgart soils.

In the Loess Hills and Terraces region the topography is characterized by hills that range from undulating to rolling and have narrow, winding drainageways. Slopes generally range from 1 to 8 percent, but some areas have slopes as steep as 20 percent. Slopes within the drainageways range from 0 to 2 percent. The major soils in this area are Loring soils on the uplands and Oaklimeter soils in the drainageways.

In the Coastal Plains region the topography ranges from broad flats to gently rolling hills that have rounded crests and narrow, winding drainageways. Slopes range from 0 to 8 percent in this area. The major soils in this area are Sacul and Sawyer soils on the uplands and Amy soils on the broad flats and in drainageways.

In the Arkansas Valley Uplands the topography is characterized by narrow ridges separated by broad valleys. Slopes range from 0 to 8 percent in the valleys and from 8 to 25 percent on the ridges. The major soils in this area are Enders, Linker, and Mountainburg soils on the ridges and Leadvale and Taft soils in the valleys.

Drainage in the northern part of Lonoke County is generally northeastward and eastward through a system of natural drainageways. The major drainageways in the northern part of the county are Cypress Bayou and Wattensaw Bayou, which drain into White River at a point east of Lonoke County, in Prairie County. Minor drains in the northern part of the county include Brush, Duck, Fourmile, Magness, Mill, and Pigeon Roost Creeks, which are tributaries of Cypress Bayou, and Collins, Faras Run, and Locust Creeks, which are tributaries of Wattensaw Bayou. Drainage in the southern part of Lonoke County is generally southward and southeastward through a system of natural and improved drainageways and connecting artificial channels. Most of the surface water from the southern part of the county enters the Arkansas River at a point south of Lonoke County, in Arkansas County or Jefferson County. Major drains in the southern part of the county include Bakers, Cross, Indian, Plum, and Salt Bayous; Crooked and Caney Creeks; Buffalo Ditch; Bayou Two Prairie and Bayou Meto. Flooding occurs frequently along some of the drainageways in low-lying areas.

Drainage in Prairie County is generally southeastward through a system of natural and improved drainageways and connecting artificial channels. The northern two-thirds of Prairie County is drained by White River and its tributaries. The major tributaries on the west side of the river are Cypress Bayou, Wattensaw Bayou, and Bayou Des Arc. On the east side, the major tributary is Cache River, which flows into the White River at a point east of Prairie County, in Monroe County. Flooding occurs frequently along White River and its tributaries, except where areas are protected by a levee. The major drains in the southern one-third of the county are Bayou Meto and La Grue Bayou. Bayou Meto flows into the Arkansas River and La Grue Bayou flows into the White River at points south of Prairie County, in Arkansas County. Flooding is frequent in low-lying areas along these drains and their tributaries.

water supply

The ground water supply in both counties is gradually decreasing because demand has increased. Depth to the ground water table has increased, especially in agricultural areas, because of an increased use of water for irrigation, fish farming, and other uses.

climate

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

Table 3 gives data on temperature and precipitation for the survey area as recorded at Searcy, Arkansas, in the period 1951 to 1978. Table 4 shows probable dates of the first freeze in fall and the last freeze in spring. Table 5 provides data on length of the growing season.

In winter the average temperature is 42 degrees F, and the average daily minimum temperature is 31 degrees. The lowest temperature on record, which occurred at Searcy on February 2, 1951, is -10 degrees. In summer the average temperature is 80 degrees, and the average daily maximum temperature is 92 degrees. The highest recorded temperature, which occurred at Searcy on July 13, 1954, is 112 degrees.

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

The total annual precipitation is about 52 inches. Of this, 26 inches, or 50 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 20 inches. The heaviest 1-day rainfall during the period of record was 5.96 inches at Searcy on January 30, 1969. Thunderstorms occur on about 60 days each year, and most occur in summer.

Average seasonal snowfall is 4 inches. The greatest snow depth at any one time during the period of record was 10 inches. On an average of 3 days, at least 1 inch of snow is on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The sun shines 70 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the southwest. Average windspeed is highest, 9 miles per hour, in spring.

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.

The soils in the survey area vary widely in their suitability for major land uses. Soil suitability ratings are based on the practices commonly used in the survey area to overcome soil limitations. These ratings reflect the ease of overcoming the limitations. They also reflect the problems that will persist even if such practices are used.

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

soil descriptions for Lonoke County

Dominantly deep, poorly drained soils on flood plains

These map units, which make up 8 percent of Lonoke County, are in the central and northern parts of the county. These units consist of loamy soils on flood plains of the Coastal Plain, Loess Hills, and Loess Plains. The soils formed in loamy alluvium.

1. Amy

Poorly drained, level, loamy soils; on flood plains in the Coastal Plain area

This map unit is in the northwestern part of Lonoke County. The soils formed in loamy alluvium.

This map unit makes up about 4 percent of Lonoke County. About 80 percent of the unit is Amy soils, and the remaining 20 percent is soils of minor extent.

Amy soils are on broad flats and in drainageways. They have a surface layer of dark grayish brown, mottled silt loam, a subsurface layer of light brownish gray, mottled silt loam, and a subsoil of light brownish gray and gray, mottled silty clay loam. Amy soils have a seasonal high water table and are subject to frequent flooding.

The minor soils in this map unit are the moderately well drained Leadvale soils and the somewhat poorly drained Taft soils on terraces and upland flats.

The soils in this map unit are used mainly as woodland and wildlife habitat, but in some areas they have been cleared and are used for cultivated crops.

These soils are generally unsuitable for cultivated crops because of wetness and flooding. They are well suited to use as woodland and as wildlife habitat.

These soils are moderately suited to use as pasture. Flooding and wetness are the main limitations to the use of these soils as pasture.

These soils are severely limited for urban uses by wetness and flooding. Overcoming these limitations is generally difficult or impractical.

2. Tichnor

Poorly drained, level, loamy soils; on flood plains in the Loess Hills and Loess Plains area

This map unit is in the northern and central parts of Lonoke County. The soils formed in loamy alluvium.

This map unit makes up about 4 percent of Lonoke County. About 80 percent of the unit is Tichnor soils, and the remaining 20 percent is soils of minor extent.

Tichnor soils are on flood plains. They have a surface layer of dark grayish brown silt loam, a subsurface layer of light brownish gray and gray, mottled silt loam, and a subsoil of light brownish gray, gray, and light gray, mottled silty clay loam and silt loam. Tichnor soils have a seasonal high water table and are subject to frequent flooding.

The minor soils in this unit are the moderately well drained Oaklimeter soils on flood plains or low terraces.

The soils in this map unit are used mainly as woodland and wildlife habitat, but in some areas they have been cleared and are used for cultivated crops.

These soils are poorly suited to use as cultivated cropland and are moderately suited to use as pasture. Flooding and wetness are the main limitations to these uses. These soils are well suited to use as woodland and as wildlife habitat.

These soils are severely limited for urban uses by wetness and flooding. Overcoming these limitations is generally difficult or impractical.

Dominantly deep to shallow, well drained soils on uplands

This map unit, which makes up 2 percent of Lonoke County, is in the northwestern part of the county. This unit consists of stony soils on uplands of the Arkansas Valley area. The soils formed in residuum of interbedded sandstone and shale.

3. Enders-Linker-Mountainburg

Well drained, deep to shallow, moderately sloping to steep, loamy and stony soils; on Arkansas Valley Uplands

This map unit is in the extreme northwestern part of Lonoke County. The Enders soils formed in a thin layer of loamy colluvial material and clayey residuum of shale or interbedded shale and sandstone. Linker and Mountainburg soils formed in loamy residuum of sandstone or interbedded sandstone and shale.

This map unit makes up about 2 percent of Lonoke County. About 60 percent of the unit is Enders soils, about 20 percent is Linker soils, about 8 percent is Mountainburg soils, and the remaining 12 percent is soils of minor extent.

Enders soils are on side slopes and crests of ridges. They have a surface layer of very dark grayish brown stony fine sandy loam and a subsoil of yellowish red silty clay and clay and mottled red, gray, and strong brown silty clay. The underlying material is weathered shale.

Linker soils are on ridgetops and the upper part of side slopes. They have a surface layer of dark brown stony fine sandy loam and a subsoil of strong brown fine sandy loam, yellowish red sandy clay loam, and yellowish red loam. Sandstone bedrock underlies the subsoil.

Mountainburg soils are on ridgetops and the upper part of side slopes. They have a surface layer of dark grayish brown stony fine sandy loam, a subsurface layer of yellowish brown very gravelly fine sandy loam, and a subsoil of strong brown very gravelly loam. Sandstone bedrock underlies the subsoil.

The minor soils in this map unit are the moderately well drained Leadvale soils and the somewhat poorly drained Taft soils on terraces and toe slopes at lower elevations.

The soils in this map unit are used mainly as woodland, but in some areas they are cleared and used as pasture. Urban development is also expanding into this area of the county. Slope, surface stones, and a very severe hazard of erosion are the main limitations to the use of these soils for farming and most other uses.

These soils are unsuitable for cultivated crops and are poorly suited to pasture because of slope, surface stones, and a very severe hazard of erosion. Enders and Linker soils are moderately suited and Mountainburg soils are poorly suited to use as woodland. Enders soils are poorly suited to most urban uses because of high shrink-swell potential and slope. Linker and Mountainburg soils are poorly suited to urban uses because of slope and depth to rock. Overcoming these limitations to urban uses is generally difficult or impractical.

Dominantly deep, moderately well drained and somewhat poorly drained soils on uplands

These map units, which make up 19 percent of Lonoke County, are in the northern part of the county. These units consist of loamy soils on uplands of the Arkansas Valley, Coastal Plain, and Loess Hills. The soils formed in loamy and clayey sediments.

4. Leadvale-Taft

Moderately well drained and somewhat poorly drained, level to gently sloping, loamy soils; on Arkansas Valley Uplands

This map unit is in the northwestern part of Lonoke County. The soils formed in loamy alluvium from nearby uplands.

This map unit makes up about 4 percent of Lonoke County. About 60 percent of the unit is Leadvale soils, about 25 percent is Taft soils, and the remaining 15 percent is soils of minor extent.

The moderately well drained Leadvale soils are on benches, terraces, and toe slopes. They have a surface layer of dark brown silt loam and a subsoil of strong brown silt loam, strong brown silty clay loam, and yellowish brown, mottled silty clay loam. These soils have a fragipan and a seasonal high water table.

The somewhat poorly drained Taft soils are on low terraces and upland flats or in depressions. They have a surface layer of brown silt loam and a subsoil of yellowish brown, mottled silt loam. These soils have a fragipan and a seasonal high water table.

The minor soils in this map unit are the poorly drained Amy soils on flood plains and the well drained Enders soils on uplands.

The soils in this map unit are used mainly for pasture and cultivated crops. Urban development is also expanding into this area of the county.

These soils are well suited to moderately suited to cultivated crops. Wetness and a hazard of erosion are the main limitations to the use of these soils for farming. These soils are well suited to use as pasture and as woodland.

Leadvale soils are moderately suited to urban uses, and Taft soils are poorly suited to urban uses. Wetness and slow permeability are the main limitations of these soils. In areas of Leadvale soils, these limitations can generally be overcome, but in areas of Taft soils, overcoming these limitations is difficult or impractical.

5. Sawyer-Leadvale-Sacul

Moderately well drained, nearly level to gently sloping, loamy soils; on Coastal Plain Uplands

This map unit is in the north-central part of Lonoke County. The soils formed in loamy and clayey alluvium.

This map unit makes up about 6 percent of Lonoke County. About 40 percent of the unit is Sawyer soils, 36 percent is Leadvale soils, 14 percent is Sacul soils, and the remaining 10 percent is soils of minor extent.

The Sawyer soils are commonly on the middle part of side slopes. They have a surface layer of dark brown silt loam and a subsoil of yellowish brown, mottled silty clay loam and mottled red, gray, and yellowish brown silty clay and clay.

The Leadvale soils are commonly on the lower part of side slopes. They have a surface layer of dark brown silt loam and a subsoil of strong brown silt loam, strong brown silty clay loam, and yellowish brown, mottled silty clay loam.

The Sacul soils are commonly on crests and the upper part of side slopes. They have a surface layer of dark brown fine sandy loam, a subsurface layer of yellowish brown fine sandy loam, and a subsoil of red silty clay, red mottled silty clay, and mottled light brownish gray, red, and yellowish brown silty clay loam.

The minor soils in this map unit are the poorly drained Amy soils on flood plains, the well drained Smithdale soils on uplands, and the somewhat poorly drained Taft soils on low terraces or in depressions.

The soils in this map unit are used mainly for pasture. In a few areas they are used for cultivated crops. Urban development is also expanding rapidly into this area of the county.

These soils are well suited to poorly suited to cultivated crops. A hazard of erosion is the main limitation to the use of these soils for farming. These soils are well suited to use as pasture and as woodland.

These soils are moderately suited to poorly suited to urban uses. The main limitations to urban uses are shrink-swell potential, wetness, slow permeability, and low strength for supporting local roads and streets. Overcoming these limitations is generally difficult or impractical.

6. Loring

Moderately well drained, nearly level to gently sloping, loamy soils; on uplands in the Loess Hills area

This map unit is in the northeastern part of Lonoke County. The soils formed in thick deposits of loess.

This map unit makes up about 9 percent of Lonoke County. About 80 percent of the unit is Loring soils, and about 20 percent is soils of minor extent.

Loring soils are on uplands. They have a surface layer of dark brown silt loam and a subsoil of brown silt loam, strong brown silty clay loam, yellowish brown, mottled silty clay loam, and yellowish brown, mottled silt loam. Loring soils have a compact, brittle fragipan and a seasonal high water table.

The minor soils in this map unit are the poorly drained Calhoun soils and the somewhat poorly drained Calloway soils on broad flats and terraces and the moderately well drained Oaklimeter soils in drainageways.

The soils in this map unit are used mainly as cropland and pasture. These soils are well suited to moderately suited to cultivated crops. Erosion is a moderate to severe hazard to the use of these soils for farming. These soils are well suited to use as pasture and as woodland.

These soils are moderately suited to poorly suited to most urban uses. Wetness and slow permeability are the main limitations to urban uses of these soils. These limitations can generally be overcome.

Dominantly deep, moderately well drained to poorly drained soils on broad flats and terraces

These map units, which make up 29 percent of Lonoke County, are in the central part of the county. These units consist of loamy soils on broad flats and terraces in the Loess Plains area. The soils formed in loamy and clayey sediments.

7. Calloway-Calhoun-Loring

Somewhat poorly drained, poorly drained, and moderately well drained, level to gently sloping, loamy soils; on broad flats and terraces in the Loess Plains area

This map unit is in the central part of Lonoke County. The soils formed in loamy windblown and alluvial sediment. They are on broad flats, terraces, and low ridges. The natural drainageways are mainly slow-flowing intermittent streams.

This map unit makes up about 20 percent of Lonoke County. About 28 percent of the unit is Calloway soils, about 26 percent is Calhoun soils, about 24 percent is Loring soils, and the remaining 22 percent is soils of minor extent.

The somewhat poorly drained Calloway soils are on terraces. They have a surface layer of dark grayish brown, mottled silt loam, a subsurface layer of grayish brown, mottled silt loam, and a subsoil of yellowish brown, mottled silt loam and grayish brown, mottled silty clay loam.

The poorly drained Calhoun soils are on broad flats. They have a surface layer of dark grayish brown, mottled silt loam, a subsurface layer of grayish brown and light brownish gray, mottled silt loam, and a subsoil of grayish brown, light brownish gray, and gray, mottled silty clay loam.

The moderately well drained Loring soils are on low ridges. They have a surface layer of dark brown silt loam and a subsoil of brown silt loam, strong brown silty clay loam, yellowish brown, mottled silty clay loam, and yellowish brown, mottled silt loam.

All of the soils have a seasonal high water table. Calloway and Loring soils have a compact, brittle fragipan.

The minor soils in this unit are the somewhat poorly drained Crowley soils on broad flats, the poorly drained Tichnor soils on flood plains, and the moderately well drained Muskogee and Stuttgart soils on low ridges and terraces.

The soils in this map unit are used mainly for cultivated crops. These soils are well suited to moderately suited to cultivated crops. Wetness commonly delays farming operations for a few days after a rain, and field drainage is needed on the Calloway and Calhoun soils. Erosion is a moderate to severe hazard to the use of the Loring soils for farming.

These soils are well suited to use as pasture and as woodland. Wetness is the main limitation to the use of the Calloway and Calhoun soils as pasture and as woodland.

The Calloway and Calhoun soils are poorly suited to urban uses, and the Loring soils are moderately suited to urban uses. Wetness and slow permeability are the main limitations to these uses. For Calloway and Calhoun soils, overcoming these limitations is generally difficult or impractical; but for Loring soils, these limitations can generally be overcome.

8. Crowley-Stuttgart

Somewhat poorly drained and moderately well drained, level and nearly level, loamy soils; on broad flats and terraces in the Loess Plains area

This map unit is in the central part of Lonoke County. The soils formed in loamy windblown material underlain by clayey alluvium.

This map unit makes up about 9 percent of Lonoke County. About 40 percent of the unit is Crowley soils, 40 percent is Stuttgart soils, and the remaining 20 percent is soils of minor extent.

The somewhat poorly drained Crowley soils are on broad flats. They have a surface layer of dark grayish brown, mottled silt loam, a subsurface layer of grayish brown and gray, mottled silt loam, and a subsoil of grayish brown, gray, and light brownish gray, mottled silty clay. These soils have a seasonal high water table.

The moderately well drained Stuttgart soils are on terraces. They have a surface layer of dark grayish brown silt loam, a subsurface layer of grayish brown and yellowish brown, mottled silt loam, and a subsoil of red, mottled silty clay, grayish brown, mottled silty clay loam, and light brownish gray, mottled silty clay loam. These soils have a seasonal high water table.

The minor soils in this unit are the poorly drained Calhoun soils on broad flats, the poorly drained Tichnor soils on flood plains, the somewhat poorly drained Calloway soils on terraces, and the moderately well drained Loring and Muskogee soils on uplands.

The soils in this map unit are used mainly for cultivated crops.

These soils are well suited to soybeans and rice. Wetness commonly delays farming operations for several days after a rain, and field drainage is needed.

These soils are well suited to use as pasture and as woodland. Wetness is a limitation to pasture and woodland management.

These soils are poorly suited to most urban uses. Wetness, slow permeability, and high shrink-swell potential are the main limitations to urban uses of these soils. Overcoming these limitations is generally difficult or impractical.

Dominantly deep, well drained to poorly drained soils on bottom lands

These map units, which make up 42 percent of Lonoke County, are in the southern part of the county. These units consist of loamy and clayey soils on bottom lands of the Arkansas River. The soils formed in loamy and clayey alluvium.

9. Perry-Portland

Poorly drained and somewhat poorly drained, level, clayey soils; on bottom lands of the Arkansas River

This map unit is in the southern part of Lonoke County. The soils formed in clayey alluvium. They are on broad flats that were formerly backswamps and slack water areas of the Arkansas River. Natural drainageways are mainly slow-flowing intermittent streams.

This map unit makes up about 21 percent of Lonoke County. About 75 percent of the unit is Perry soils, 15 percent is Portland soils, and the remaining 10 percent is soils of minor extent and small areas of water.

The poorly drained Perry soils have a surface layer of dark gray, mottled silty clay and a subsoil of gray, dark gray, and reddish brown, mottled clay. These soils have a seasonal high water table.

The somewhat poorly drained Portland soils are at slightly higher elevations than the Perry soils. They have a surface layer of dark brown, mottled silty clay and a subsoil of brown and reddish brown, mottled silty clay and reddish brown silty clay loam. These soils have a seasonal high water table.

The minor soils in this unit are the well drained Caspiana soils, the well drained Rilla soils, and the somewhat poorly drained Hebert soils on natural levees; the somewhat poorly drained Moreland soils on similar landscapes; and the very poorly drained Yorktown soils in abandoned oxbows.

The soils in this unit are used mainly for cultivated crops, but some areas which are frequently flooded are used mostly as woodland and as wildlife habitat. Reservoirs have been constructed in several areas and are used for catfish and minnow production.

These soils are well suited to rice and soybeans. Wetness commonly delays farming operations for several days after a rain, and field drainage is needed. In some areas, flooding is a severe hazard.

These soils are well suited to use as pasture and as woodland. Wetness is a severe limitation to pasture and woodland management.

These soils are severely limited for most urban uses. Wetness, flooding, very slow permeability, and high shrink-swell potential are the main limitations. Overcoming these limitations is difficult or impractical.

10. Hebert-Rilla

Somewhat poorly drained and well drained, level and nearly level, loamy soils; on bottom lands of the Arkansas River

This map unit is in the southern part of Lonoke County. The soils formed in loamy alluvium. They are on natural levees along former channels of the Arkansas River. Natural drainageways are mainly slow-flowing, intermittent streams.

This soil unit occupies about 21 percent of the county. About 58 percent of the unit is Hebert soils, about 18 percent is Rilla soils, and the remaining 24 percent is soils of minor extent.

The somewhat poorly drained Hebert soils are on the lower parts of natural levees. They have a surface layer of brown silt loam, a subsurface layer of grayish brown, mottled silt loam; and a subsoil of reddish brown, mottled silty clay loam and reddish brown and brown, mottled silt loam.

The well drained Rilla soils are on the higher parts of natural levees. They have a surface layer of dark brown silt loam, a subsurface layer of brown silt loam, and a subsoil of reddish brown silty clay loam and yellowish red silt loam.

The minor soils in this map unit are the well drained Caspiana and Keo soils on the higher parts of natural levees, the somewhat poorly drained Moreland and Portland soils on broad flats, the poorly drained Perry soils on broad flats, and the very poorly drained Yorktown soils in abandoned oxbows.

The soils in this map unit are used mainly for cultivated crops. These soils are well suited to cultivated crops. Surface drainage is usually needed to control wetness on Hebert soils, and conservation measures are needed to control erosion on some areas of the Rilla soils.

These soils are well suited to use as pasture and as woodland. Wetness is a moderate limitation to the use of the Hebert soils as pasture and woodland.

These soils are moderately suited to poorly suited to most urban uses. Wetness, slow permeability, and moderate shrink-swell potential are the main limitations to most urban uses of the Hebert soils. Moderate shrink-swell potential is the main limitation to urban uses of the Rilla soils. These limitations can generally be overcome.

soil descriptions for Prairie County

Dominantly deep, poorly drained soils on flood plains

This map unit, which makes up 4 percent of Prairie County, is in the northwestern, southwestern, and central parts of the county. This unit consists of loamy soils on flood plains of the Loess Hills and Loess Plains. The soils formed in loamy alluvium.

1. Tichnor

Poorly drained, level, loamy soils; on flood plains in the Loess Hills and Loess Plains area

This map unit is in the northwestern, southwestern, and central parts of Prairie County. The soils formed in loamy alluvium. They are on flood plains of streams that drain loess uplands.

This map unit makes up about 4 percent of Prairie County. About 80 percent of the unit is Tichnor soils, and the remaining 20 percent is soils of minor extent.

Tichnor soils are on flood plains. They have a surface layer of dark grayish brown silt loam, a subsurface layer of light brownish gray and gray, mottled silt loam, and a subsoil of light brownish gray, gray, and light gray, mottled silty clay loam and silt loam. Tichnor soils have a seasonal high water table and are subject to frequent flooding.

The minor soils in this unit are the moderately well drained Oaklimeter soils on flood plains or low terraces.

The soils in this map unit are used mainly as woodland and as wildlife habitat. Some areas have been cleared and are used for cultivated crops.

These soils are poorly suited to cultivated crops because of wetness and flooding. These soils are moderately suited to use as pasture. Flooding and wetness are the main limitations to the use of these soils as pasture. These soils are well suited to use as woodland and as wildlife habitat.

These soils are severely limited for urban uses by wetness and flooding. Overcoming these limitations is generally difficult or impractical.

Dominantly deep, poorly drained to moderately well drained soils on broad flats and terraces

These map units, which make up 59 percent of Prairie County, are throughout Prairie County. These units consist of loamy soils on broad flats and terraces in the Loess Plains area. The soils formed in loamy and clayey sediments.

2. Calhoun-Calloway-Loring

Poorly drained, somewhat poorly drained, and moderately well drained, level and gently sloping, loamy soils; on broad flats and terraces in the Loess Plains area

This map unit is mainly in the western part of Prairie County. The soils formed in loamy windblown and alluvial sediments.

This map unit makes up about 32 percent of Prairie County. About 35 percent of the unit is Calhoun soils, about 30 percent is Calloway soils, about 20 percent is Loring soils, and the remaining 15 percent is soils of minor extent.

The poorly drained Calhoun soils are on broad flats. They have a surface layer of dark grayish brown, mottled silt loam, a subsurface layer of grayish brown and light brownish gray, mottled silt loam, and a subsoil of grayish brown, light brownish gray, and gray, mottled silty clay loam.

The somewhat poorly drained Calloway soils are on terraces. They have a surface layer of dark grayish brown, mottled silt loam, a subsurface layer of grayish brown, mottled silt loam, and a subsoil of yellowish brown and light brownish gray, mottled silt loam and grayish brown, mottled silty clay loam.

The moderately well drained Loring soils are on low ridges. They have a surface layer of dark brown silt loam. The subsoil is brown silt loam, strong brown silty clay loam, yellowish brown, mottled silty clay loam, and yellowish brown, mottled silt loam.

All of the soils have a seasonal high water table. Calloway and Loring soils have a compact, brittle fragipan.

The minor soils in this unit are the somewhat poorly drained Crowley soils on broad flats, the poorly drained Tichnor soils on flood plains, and the moderately well drained Muskogee and Stuttgart soils on low ridges and terraces.

The soils in this map unit are used mainly for cultivated crops. These soils are well suited to moderately suited to cultivated crops. Wetness commonly delays farming operations for a few days after a rain, and field drainage is needed on the Calloway and Calhoun soils. Erosion is a moderate to severe hazard to the use of the Loring soils for farming, and conservation measures are needed.

This unit is well suited to pasture and woodland use. Wetness is the main limitation to the use of the Calloway and Calhoun soils as pasture and woodland.

The Calloway and Calhoun soils are poorly suited to urban uses, and the Loring soils are moderately suited to urban uses. Wetness and slow permeability are the main limitations to these uses. For Calloway and Calhoun soils, overcoming these limitations is generally difficult or impractical. For Loring soils, these limitations can generally be overcome.

3. Crowley-Stuttgart

Somewhat poorly drained and moderately well drained, level and nearly level, loamy soils; on broad flats and terraces in the Loess Plains area

This map unit occurs throughout Prairie County. The soils formed in loamy material underlain by clayey alluvium. The major portion of this unit is in the southern part of the county.

This map unit makes up about 27 percent of Prairie County. About 50 percent of the unit is Crowley soils, 30 percent is Stuttgart soils, and the remaining 20 percent is soils of minor extent.

The somewhat poorly drained Crowley soils are on broad flats. They have a surface layer of dark grayish brown, mottled silt loam, a subsurface layer of grayish brown and gray, mottled silt loam, and a subsoil of grayish brown, gray, and light brownish gray, mottled silty clay. These soils have a seasonal high water table.

The moderately well drained Stuttgart soils are on terraces. They have a surface layer of dark grayish brown silt loam, a subsurface layer of grayish brown and yellowish brown, mottled silt loam, and a subsoil of red, mottled silty clay, grayish brown, mottled silty clay loam, and light brownish gray, mottled silty clay loam. These soils have a seasonal high water table.

The minor soils in this unit are the poorly drained Calhoun soils on broad flats, the poorly drained Tichnor soils on flood plains, the poorly drained Jackport soils on terraces, the somewhat poorly drained Calloway soils on terraces, and the moderately well drained Loring and Muskogee soils on uplands.

The soils in this map unit are used mainly for cultivated crops. Wetness is the main limitation of these soils for farming and most other uses.

These soils are well suited to soybeans and rice. Wetness commonly delays operations for several days after a rain, and field drainage is needed.

These soils are well suited to use as pasture and as woodland. Wetness is a limitation to pasture and woodland management.

These soils are poorly suited to most urban uses. Wetness, slow permeability, and high shrink-swell potential are the main limitations to urban uses. Overcoming these limitations is generally difficult or impractical.

Dominantly deep, moderately well drained and well drained soils on uplands

These map units, which make up 16 percent of Prairie County, are in the northwestern and central parts of the county. These units consist of loamy soils on uplands of the Loess Hills. The soils formed in loamy and clayey sediments.

4. Loring

Moderately well drained, nearly level to gently sloping, loamy soils; on uplands in the Loess Hills area

This map unit, except for one small area in the southeastern corner, is in the northwestern and central parts of Prairie County. The soils formed in thick deposits of loess.

This map unit makes up about 12 percent of Prairie County. About 70 percent of the unit is Loring soils, and about 30 percent is soils of minor extent.

Loring soils are on uplands. They have a surface layer of dark brown silt loam and a subsoil of brown silt loam, strong brown silty clay loam, yellowish brown, mottled silty clay loam, and yellowish brown, mottled silt loam. Loring soils have a compact, brittle fragipan and a seasonal high water table.

The minor soils in this unit are the poorly drained Calhoun soils and somewhat poorly drained Calloway soils on broad flats and terraces, and the moderately well drained Oaklimeter soils on drainageways.

The soils in this unit are used mainly as cropland and as pasture. These soils are well suited to moderately suited to cultivated crops. Erosion is a moderate to severe hazard to the use of these soils for farming, and conservation practices are needed. These soils are well suited to use as pasture and as woodland.

These soils are moderately suited to poorly suited to most urban uses. Wetness and slow permeability are the main limitations to urban uses. These limitations can generally be overcome.

5. Loring-McKamie

Moderately well drained and well drained, gently sloping to moderately steep, loamy soils; on uplands in the Loess Hills area

This map unit is in the central part of Prairie County. The Loring soils formed in thick deposits of loess. The McKamie soils formed in red clayey alluvium.

This map unit makes up about 4 percent of Prairie County. About 60 percent of the unit is Loring soils, about 20 percent is McKamie soils, and the remaining 20 percent is soils of minor extent.

The moderately well drained Loring soils are on uplands. They have a surface layer of dark brown silt loam and a subsoil of brown silt loam, strong brown silty clay loam, yellowish brown, mottled silty clay loam, and yellowish brown, mottled silt loam. Loring soils have a compact, brittle fragipan and a seasonal high water table.

The well drained McKamie soils are on the lower side slopes on uplands. They have a surface layer of dark brown silt loam and a subsoil of red clay and silty clay loam.

The minor soils in this unit are the moderately well drained Muskogee soils on uplands and the moderately well drained Oaklimeter soils and poorly drained Tichnor soils in drainageways.

The soils in this map unit are used mainly as pasture and as woodland. A hazard of erosion is the main limitation to the use of these soils.

These soils are moderately suited to poorly suited to cultivated crops because of a severe or very severe hazard of erosion.

These soils are well suited to moderately suited to use as pasture. A hazard of erosion is the main limitation to the use of these soils as pasture, and good management practices are needed. These soils are well suited to use as woodland.

These soils are moderately suited to poorly suited to most urban uses. Slope, wetness, and slow permeability are the main limitations of Loring soils to urban uses. Slope, high shrink-swell potential, and slow permeability are the main limitations of McKamie soils to urban uses. Overcoming these limitations is generally difficult and requires special engineering design.

Dominantly deep, poorly drained to well drained soils on bottom lands

These map units, which make up 21 percent of Prairie County, are in the eastern and southwestern parts of the county. These units consist of loamy and clayey soils on bottom lands of the Arkansas River and White River. The soils formed in loamy and clayey alluvium.

6. Kobel-Commerce

Poorly drained and somewhat poorly drained, level and nearly level, clayey and loamy soils; on bottom lands of the White River

This map unit is in the eastern part of Prairie County. The soils formed in clayey and loamy alluvium. They are on broad flats and low terraces of bottom lands that were formerly backswamps and slack water areas of White River and its tributaries. Natural drainageways are mainly slow-flowing, intermittent streams.

This map unit makes up about 17 percent of Prairie County. About 60 percent of the unit is Kobel soils, 30 percent is Commerce soils, and the remaining 10 percent is soils of minor extent and areas of water.

The poorly drained Kobel soils are on broad flats. They have a surface layer of dark grayish brown and very dark grayish brown silty clay loam and a subsoil of dark gray and gray, mottled silty clay. These soils have a seasonal high water table.

The somewhat poorly drained Commerce soils are on low terraces. They have a surface layer of dark grayish brown silt loam and a subsoil of grayish brown, mottled silty clay loam. These soils have a seasonal high water table.

The minor soils in this unit are the well drained Dubbs soils on natural levees and the poorly drained Jackport soils on terraces.

The soils in this unit are used mainly for cultivated crops in areas that are protected from flooding. In areas that are subject to frequent flooding, they are used mainly as woodland and as wildlife habitat and for crops that have a short growing season.

These soils are well suited to cultivated crops in areas that are protected from flooding. These soils are poorly suited to cultivated crops in areas that are subject to frequent flooding. Wetness and flooding are the main limitations to the use of these soils for farming.

These soils are well suited to moderately suited to use as pasture and are well suited to use as woodland. Wetness and flooding are the main limitations to the use of these soils as pasture and as woodland.

The soils are severely limited for urban uses because of flooding and wetness. High shrink-swell potential is also a severe limitation to urban uses of Kobel soils. Overcoming these limitations is generally difficult or impractical.

7. Dubbs

Well drained, level to nearly level, loamy soils; on bottom lands of the White River

This map unit is in the eastern part of Prairie County. The soils formed in loamy alluvium. They are on natural levees on bottom lands along former channels of the White River.

This map unit makes up about 2 percent of the county. About 80 percent of the unit is Dubbs soils, and about 20 percent is soils of minor extent.

Dubbs soils are on natural levees. They have a surface layer of dark brown silt loam and a subsoil of brown silt loam, silty clay loam, and loam.

The minor soils in this unit are the somewhat poorly drained Commerce soils on low terraces and the poorly drained Kobel soils on broad flats.

The soils in this map unit are used mainly for cultivated crops. Erosion is a moderate hazard to the use of these soils for farming on the more sloping areas.

These soils are well suited to use as cropland, pasture, and woodland and to most urban uses.

8. Perry

Poorly drained, level, clayey soils; on bottom lands of the Arkansas River

This map unit is in the southwestern part of Prairie County. The soils formed in clayey alluvium. They are on broad flats that were formerly backswamps and slack water areas of the Arkansas River.

This map unit makes up about 2 percent of Prairie County. About 80 percent of the unit is Perry soils, and the remaining 20 percent is soils of minor extent and areas of water.

Perry soils have a surface layer of dark gray, mottled silty clay and a subsoil of gray, dark gray, and reddish brown, mottled clay. They have a seasonal high water table.

The minor soils in this unit are the poorly drained Tichnor soils on similar landscapes.

Most of the soils in this map unit are frequently flooded and are used mainly as woodland and as wildlife habitat. A few areas are protected from flooding and are used for rice and soybean production.

These soils are poorly suited to cultivated crops in areas that are subject to frequent flooding. They are well suited to rice and soybeans in areas that are protected from flooding. Wetness and flooding are the main limitations to the use of these soils for farming.

The soils in this map unit are well suited to moderately suited to use as pasture. Wetness and flooding are the main limitations to this use.

These soils are well suited to use as woodland. Wetness and flooding are the main limitations to woodland management of these soils.

These soils are severely limited for most urban uses. Wetness, flooding, very slow permeability, and high shrink-swell potential are the main limitations to urban uses of these soils. Overcoming these limitations is difficult or impractical.

broad land use considerations

Deciding which land should be used for urban development is an important issue in the survey area. Each year, land is developed for urban uses in Cabot, Carlisle, England, Lonoke, and other cities in Lonoke County and in Des Arc, DeValls Bluff, Hazen, and other cities in Prairie County. Urban or built-up land takes in about 30,000 acres in Lonoke County and about 10,500 acres in Prairie County. The general soil map is helpful for planning the general outline of urban areas; however, it cannot be used for the selection of sites for specific urban structures. Generally, soils in the survey area that are well suited to urban development also are well suited to crop production. The data about specific soils in this survey can be helpful in planning future land use patterns.

Areas of soils unsuitable for urban development are not extensive in the survey area. Parts of several map units, such as the Tichnor unit in Lonoke and Prairie Counties, are on flood plains where flooding is a severe limitation to urban development. In several units, such as the Crowley-Stuttgart unit in Lonoke and Prairie Counties, the soils are severely limited for urban uses because of shrink-swell potential, slow permeability, and wetness. In the Enders-Linker-Mountainburg unit in Lonoke County, shrink-swell potential, depth to bedrock, and steepness of slope are severe limitations for urban uses.

There are areas in the survey area where the soils are well suited to urban development. These areas are in parts of the Hebert-Rilla unit in Lonoke County and the Dubbs unit in Prairie County. These soils are also well suited to use as farmland and this should be considered in broad planning.

In both counties, extensive areas are well suited to rice and soybean production. In Lonoke County, these areas are in parts of the Crowley-Stuttgart unit, the Calloway-Calhoun-Loring unit, and the Perry-Portland unit. In Prairie County, these areas are in parts of the Crowley-Stuttgart unit and the Calhoun-Calloway-Loring unit. These same areas are generally poorly suited to urban development because of wetness, shrink-swell potential, and slow permeability. Overcoming these limitations is generally difficult or impractical. It should be noted that these soils are suited to crop production because most farmers have provided sufficient drainage.

Most of the soils in the survey area are well suited to moderately suited to woodland.

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, Loring silt loam, 1 to 3 percent slopes, is one of several phases in the Loring series.

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

A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Loring-McKamie complex, 8 to 20 percent slopes, is an example.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major 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.

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

soil descriptions

1—Amy silt loam, frequently flooded. This deep, poorly drained, level soil is on flood plains of local drainageways. Normally, it is flooded each year. Slopes are 0 to 1 percent. Areas range from about 40 to more than 1,000 acres.

Typically, the surface layer is dark grayish brown, mottled silt loam about 4 inches thick. The subsurface layer is light brownish gray, mottled silt loam that extends to a depth of about 19 inches. The upper part of the subsoil is light brownish gray, mottled silty clay loam that extends to a depth of about 46 inches. The lower part of the subsoil is gray, mottled silty clay loam that extends to a depth of about 66 inches. The underlying material is gray, mottled silt loam that extends to a depth of 72 inches or more.

This soil is low in natural fertility and organic matter content. It is very strongly acid or strongly acid throughout. Permeability is slow, and the available water capacity is high. A perched water table is within 1 foot of the surface in winter and early in spring. Flooding is frequent and normally occurs between December and June.

Included with this soil in mapping are a few small areas of Oaklimeter and Taft soils and soils similar to Amy that have silty clay texture in the lower part of the subsoil. Also included are a few areas that are protected by levees from flooding.

This soil is generally unsuitable for cultivated crops because of frequent flooding. Crops which require a short growing season, such as soybeans, can be grown, but flooding is likely to damage the crop in some years.

This soil is moderately suited to use as pasture and as hayland. Flooding may damage the pasture and hay in some years. Pasture plants that grow well on this soil include bermudagrass and tall fescue.

This soil is well suited to use as woodland, and this is its main use. Trees that commonly grow on this soil are green ash, sweetgum, and water oak. Wetness and flooding severely limit the use of equipment in managing this soil and may cause severe seedling mortality.

This soil is severely limited for most urban uses. Its use as sites for dwellings and small commercial buildings is severely limited by flooding and wetness. Its use as sites for local roads and streets is severely limited by flooding, wetness, and low strength. Its use as septic tank filter fields is severely limited by flooding, wetness, and slow permeability. Overcoming these limitations is difficult or impractical.

This soil is in capability unit Vw-1 and woodland suitability group 2w9.

2—Calhoun silt loam, 0 to 1 percent slopes. This deep, poorly drained, level soil is on broad flats and in depressions on Loess Plains. Areas range from about 20 to more than 1,000 acres.

Typically, the surface layer is dark grayish brown, mottled silt loam about 5 inches thick. The subsurface layer is grayish brown and light brownish gray, mottled silt loam that extends to a depth of about 18 inches. The upper part of the subsoil is grayish brown, mottled silty clay loam that extends to a depth of about 41 inches. The middle part is light brownish gray, mottled silty clay loam that extends to a depth of about 52 inches. The lower part is gray, mottled silty clay loam that extends to a depth of 72 inches or more.

This soil is moderate in natural fertility and low in organic matter content. Reaction in the surface layer ranges from very strongly acid to medium acid. Reaction in the subsoil is very strongly acid and strongly acid in the upper part and ranges from very strongly acid to neutral in the lower part. Permeability is slow, and the available water capacity is high. A perched high water table is within 0.5 foot to 2 feet of the surface in winter and early in spring.

Included with this soil in mapping are a few areas of Calloway and Crowley soils and soils that are similar to Calhoun soils but do not have silty gray streaks extending into the subsoil.

This soil is well suited to rice and soybeans and is used mainly for these crops. Cotton and grain sorghum are also grown on this soil. Wetness is a severe limitation to cropland use and may delay farming operations for several days after a rain. Surface drains are needed in most areas. This soil responds well to fertilization, and tilth is easy to maintain by returning crop residue to the soil.

This soil is well suited to use as pasture and as hayland. Wetness during winter and early in spring is the main limitation to these uses. Pasture plants which grow well on this soil include bermudagrass, bahiagrass, and tall fescue.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are cherrybark oak, water oak, sweetgum, and loblolly pine. Wetness is a severe limitation to the use of equipment in managing and harvesting the tree crop but can generally be overcome by harvesting during the drier season.

This soil is poorly suited to most urban uses. Its use as septic tank filter fields is severely limited by slow permeability and wetness. Its use as sites for dwellings, small commercial buildings, and local roads and streets is severely limited by wetness. Low strength is an additional severe limitation to the use of this soil as sites for local roads and streets. Overcoming these limitations is difficult or impractical.

This soil is in capability unit IIIw-1 and woodland suitability group 3w9.

3—Calloway silt loam, 0 to 1 percent slopes. This deep, somewhat poorly drained, level soil is on broad flats and terraces. Areas range from about 20 to more than 1,000 acres.

Typically, the surface layer is dark grayish brown, mottled silt loam about 5 inches thick. The subsurface layer is grayish brown, mottled silt loam that extends to a depth of about 10 inches. The upper part of the subsoil is yellowish brown, mottled silt loam that extends to a depth of about 21 inches. Below this is a layer of light brownish gray, mottled silt loam that extends to a depth of about 26 inches. The middle part of the subsoil is a grayish brown, mottled silty clay loam fragipan that extends to a depth of about 60 inches. The lower part is grayish brown, mottled silty clay loam that extends to a depth of 72 inches or more.

This soil is moderate in natural fertility and low in organic matter content. Reaction ranges from very strongly acid to medium acid in the surface layer and upper part of the subsoil and from strongly acid to neutral in the lower part of the subsoil. Permeability is slow, and the available water capacity is medium. A perched water table is within about 1 to 2 feet of the surface in winter and early in spring. A compact, brittle fragipan at about 16 to 32 inches restricts the penetration of roots and the movement of water through the soil.

Included with this soil in mapping are a few small areas of Calhoun and Loring soils and a few areas of soils that are similar to Calloway soils but have a thin clayey layer above the fragipan.

This soil is well suited to row crops. The main crop is soybeans. Cotton, grain sorghum, and rice are also grown on this soil. Winter small grain can be grown if surface drainage is adequate. Wetness is a moderate limitation to the use of this soil as cropland and may delay farming operations for a few days after a rain. Surface drains are needed in some areas. This soil responds well to fertilization, and tilth is easy to maintain by returning crop residue to the soil.

This soil is well suited to use as pasture and as hayland. Wetness moderately limits these uses during winter and early in spring. Pasture plants which grow well on this soil include bermudagrass, bahiagrass, and tall fescue.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are cherrybark oak, loblolly pine, sweetgum, and water oak. Wetness moderately limits the use of equipment in managing and harvesting the tree crop. This limitation can be overcome by harvesting during the drier seasons.

This soil is poorly suited to most urban uses. Its use for septic tank filter fields is severely limited by slow permeability and wetness. Its use as sites for dwellings and small commercial buildings is severely limited by wetness. These limitations are usually difficult to overcome. The use of this soil for local roads and streets is severely limited by low strength. This limitation can usually be overcome by proper engineering design.

This soil is in capability unit IIw-1 and woodland suitability group 2w8.

4—Caspiana silt loam, 0 to 1 percent slopes. This deep, well-drained, level soil is on natural levees that border abandoned stream channels of the Arkansas River. Areas range from about 40 to 800 acres.

Typically, the surface layer is very dark grayish brown silt loam about 6 inches thick. The upper part of the subsoil is very dark brown silt loam that extends to a depth of about 11 inches. The middle part is very dark grayish brown and brown silt loam that extends to a depth of about 16 inches. The lower part is brown silt loam that extends to a depth of about 36 inches. The underlying material to a depth of about 49 inches is brown very fine sandy loam. Below that, to a depth of 72 inches or more, it is reddish brown silty clay loam and very fine sandy loam.

This soil is high in natural fertility and moderate in organic matter content. Permeability is moderate, and the available water capacity is high. Reaction ranges from medium acid to neutral in the surface layer, from medium acid to moderately alkaline in the subsoil, and from slightly acid to moderately alkaline in the underlying material.

Included with this soil in mapping are a few small areas of Hebert, Keo, and Rilla soils.

This soil is well suited to winter small grain and row crops. The main crops are soybeans and cotton. Grain sorghum is also grown on this soil. Few limitations restrict the use of this soil as cropland. This soil responds well to fertilization, and tilth is easy to maintain by returning crop residue to the soil.

This soil is well suited to use as pasture and as hayland. Pasture plants which grow well on this soil include bermudagrass, lespedeza, bahiagrass, and tall fescue.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are cherrybark oak, pecan, and sweetgum. There are no significant limitations to woodland use or management of this soil.

This soil is moderately suited to most urban uses. Its use as septic tank filter fields is moderately limited by moderate permeability and wetness. Its use as sites for dwellings, small commercial buildings, and local roads and streets is moderately limited by moderate shrink-swell potential. Low strength is a severe limitation to the use of this soil as sites for local roads and streets. These limitations can generally be overcome by proper drainage.

This soil is in capability unit I-1 and woodland suitability group 2o4.

5—Commerce silt loam, 0 to 1 percent slopes. This deep, somewhat poorly drained, level soil is on low terraces that were formerly flood plains of the White River. This soil is now protected from flooding by a levee. Areas range from about 40 to more than 1,000 acres.

Typically, the surface layer is dark grayish brown silt loam that extends to a depth of about 5 inches. The subsoil is grayish brown, mottled silty clay loam that extends to a depth of about 34 inches. The underlying material is stratified, grayish brown and gray, mottled silty clay loam, silt loam, and loam that extends to a depth of 72 inches or more.

This soil is high in natural fertility and moderate in organic matter content. Reaction ranges from medium acid to neutral in the surface layer, from slightly acid to mildly alkaline in the subsoil, and from neutral to moderately alkaline in the underlying material. Permeability is moderately slow, and the available water capacity is high. The water table is seasonally high, within about 1.5 to 4.0 feet of the surface in winter and early in spring.

Included with this soil in mapping are a few small areas of Dubbs and Kobel soils and a few areas that are subject to occasional flooding.

This soil is well suited to row crops. The main crop is soybeans. Cotton and rice are also grown on this soil. Wetness is a moderate limitation to cropland use and may delay farming operations for a few days after a rain. Surface drains are needed in most areas. This soil responds well to fertilization, and tilth is easy to maintain by returning crop residue to the soil.

This soil is well suited to use as pasture and as hayland. Wetness is a moderate limitation to these uses during the winter and early in spring. Pasture plants which grow well on this soil include bermudagrass, bahiagrass, and tall fescue.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are green ash, eastern cottonwood, Nuttall oak, water oak, and sycamore. Wetness moderately limits the use of equipment in managing and harvesting the tree crop; however, this limitation can be overcome by harvesting during the drier season.

This soil is moderately suited to poorly suited to most urban uses. The use of this soil as septic tank filter fields is severely limited by slow permeability and wetness. These limitations are usually difficult to overcome. The use of this soil as sites for dwellings and small commercial buildings is moderately limited by wetness and moderate shrink-swell potential. Its use as sites for local roads and streets is severely limited by low strength. The limitations of wetness, shrink-swell, and low strength can generally be overcome by drainage and proper engineering design.

This soil is in capability unit IIw-2 and woodland suitability group 1w5.

6—Commerce silt loam, frequently flooded. This deep, somewhat poorly drained soil is on undulating flood plains of the White River and its tributaries. These areas are flooded in most years. Slopes range from 0 to 3 percent. Areas range from about 80 to more than 1,000 acres.

Typically, the surface layer is dark grayish brown silt loam that extends to a depth of about 5 inches. The subsoil is grayish brown, mottled silty clay loam that extends to a depth of about 34 inches. The underlying material is stratified, grayish brown and gray, mottled silty clay loam, silt loam, and loam that extends to a depth of 72 inches or more.

This soil is high in natural fertility and moderate in organic matter content. Reaction ranges from medium acid to neutral in the surface layer, from slightly acid to mildly alkaline in the subsoil, and from neutral to moderately alkaline in the underlying material. Permeability is moderately slow, and the available water capacity is high. The water table is seasonally high, within 1.5 to 4.0 feet of the surface in winter and early in spring. Flooding is frequent and normally occurs between December and May.

Included with this soil in mapping are a few small areas of Kobel soils and small areas of similar soils that have surface textures of fine sandy loam and silty clay loam.

This soil is poorly suited to cultivated crops because of frequent flooding that occurs in most years. Crops that require a short growing season, such as soybeans, can be grown, but flooding is likely to damage the crop in some years.

This soil is moderately suited to use as pasture and as hayland. Wetness and flooding are the main limitations to these uses during the winter and early in spring. Flooding may cause damage to pasture and hay in some years. Pasture plants that grow well on this soil include bermudagrass and tall fescue.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are green ash, eastern cottonwood, Nuttall oak, water oak, and sycamore. Wetness and flooding moderately limit the use of equipment in managing and harvesting the tree crop. These limitations can be overcome by harvesting during the drier season.

This soil has severe limitations for urban uses. Its use as sites for dwellings and small commercial buildings is severely limited by flooding. Flooding, wetness, and moderately slow permeability severely limit its use as septic tank filter fields. The use of this soil as sites for local roads and streets is severely limited by flooding and low strength. Overcoming these limitations is difficult or impractical.

This soil is in capability unit IVw-1 and woodland suitability group 1w5.

7—Crowley silt loam, 0 to 1 percent slopes. This deep, somewhat poorly drained, level soil is on broad flats and terraces on the Loess Plains. Slopes are 0 to 1 percent. Areas range from about 40 to more than 1,000 acres.

Typically, the surface layer is dark grayish brown, mottled silt loam about 5 inches thick. The subsurface layer is grayish brown and gray, mottled silt loam that extends to a depth of about 22 inches. The upper part of the subsoil is grayish brown, mottled silty clay that extends to a depth of about 36 inches. The middle part is gray, mottled silty clay that extends to a depth of about 53 inches. The lower part is light brownish gray, mottled silty clay that extends to a depth of 72 inches or more.

This soil is moderate in natural fertility and low in organic matter content. Reaction ranges from very strongly acid to medium acid in the surface layer, from very strongly acid to medium acid in the upper part of the subsoil, and from medium acid to mildly alkaline in the lower part of the subsoil. Permeability is very slow, and the available water capacity is high. A perched high water table is within 18 inches of the surface in winter and early in spring.

Included with this soil in mapping are a few areas of Calhoun and Stuttgart soils and a few areas of soils that are similar to Crowley soils but which do not have red mottles in the subsoil.

This soil is well suited to rice and soybeans, and it is mainly used for these crops. Cotton and grain sorghum are also grown on this soil. Wetness is a severe limitation to the use of this soil as cropland and may delay farming operations for several days after a rain. Surface drains are needed in most areas. This soil responds well to fertilization, and tilth is easy to maintain by returning crop residue to the soil. Exposure of the clayey subsoil is a moderate hazard if deep cuts are to be made in grading and smoothing, and depth to this layer should be determined before cuts are made.

This soil is well suited to use as pasture and as hayland. Wetness is a moderate limitation to these uses during the winter and early in spring. Pasture plants that grow well on this soil are bermudagrass, bahiagrass, and tall fescue.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are loblolly pine, cherrybark oak, water oak, and sweetgum. Wetness is a severe limitation to the use of equipment in managing and harvesting the tree crop. This limitation can generally be overcome by harvesting during the drier season.

This soil is poorly suited to most urban uses. Its use as septic tank filter fields is severely limited by slow permeability and wetness. Its use as sites for dwellings, small commercial buildings, and local roads and streets is severely limited by high shrink-swell potential and wetness. Low strength is an additional limitation to the use of this soil as sites for local roads and streets. Overcoming these limitations is difficult or impractical.

This soil is in capability unit IIIw-1 and woodland suitability group 3w9.

8—Dubbs silt loam, 0 to 1 percent slopes. This deep, well drained, level soil is on natural levees on bottom lands that border abandoned stream channels of the White River and its tributaries. Areas range from about 40 to 400 acres.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The upper part of the subsoil is brown silt loam that extends to a depth of about 24 inches. The middle part is brown silty clay loam that extends to a depth of about 38 inches. The lower part of the subsoil is brown loam that extends to a depth of about 52 inches. The underlying material is brown loamy fine sand that extends to a depth of 72 inches or more.

This soil is moderate in natural fertility and low in organic matter content. Permeability is moderate, and the available water capacity is high. Reaction ranges from strongly acid to medium acid in the surface layer and from very strongly acid to medium acid in the subsoil and underlying material.

Included with this soil in mapping are a few small areas of Commerce soils and a few small areas of soils that have a fine sandy loam surface layer.

This soil is well suited to row crops and winter small grain. The main crops are cotton and soybeans. Grain sorghum is also grown on this soil. Few limitations restrict the use of this soil for cropland. It responds well to fertilization, and tilth is easy to maintain by returning crop residue to the soil.

This soil is well suited to use as pasture and as hayland. Pasture plants which grow well on this soil include bermudagrass, bahiagrass, lespedeza, and tall fescue.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are cherrybark oak, green ash, Nuttall oak, Shumard oak, willow oak, and sweetgum. There are no significant limitations to woodland use or management of this soil.

This soil is well suited to most urban uses. It has no significant limitations for urban use.

This soil is in capability unit I-1 and woodland suitability group 2o4.

9—Dubbs silt loam, 1 to 3 percent slopes. This deep, well drained, nearly level soil is on natural levees on bottom lands that border abandoned stream channels of the White River and its tributaries. Areas range from about 40 to more than 1,000 acres.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The upper part of the subsoil is brown silt loam that extends to a depth of about 24 inches. The middle part is brown silty clay loam that extends to a depth of about 38 inches. The lower part is brown loam that extends to a depth of about 52 inches. The underlying material is brown loamy fine sand that extends to a depth of 72 inches or more.

This soil is moderate in natural fertility and low in organic matter content. Permeability is moderate, and the available water capacity is high. Reaction is strongly acid and medium acid in the surface layer and ranges from very strongly acid to medium acid in the subsoil and underlying material.

Included with this soil in mapping are a few small areas of Commerce soils and a few areas of soils that have a fine sandy loam surface layer. Also included are a few narrow areas that have slopes greater than 3 percent.

This soil is well suited to row crops and winter small grain. The main crops are cotton and soybeans. Grain sorghum is also grown on this soil. Erosion is a moderate hazard if row crops are grown. Such practices as minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion. This soil responds well to fertilization, and tilth is easy to maintain by returning crop residue to the soil.

This soil is well suited to use as pasture and as hayland. Pasture plants which grow well on this soil include bermudagrass, bahiagrass, lespedeza, and tall fescue.

This soil is well suited to use as woodland. Trees that commonly grow well on this soil are cherrybark oak, Nuttall oak, Shumard oak, willow oak, green ash, and sweetgum. There are no significant limitations to woodland use or management.

This soil is well suited to most urban uses. It has no significant limitations for urban use.

This soil is in capability unit IIe-1 and woodland suitability group 2o4.

10—Enders stony fine sandy loam, 8 to 15 percent slopes. This deep, well drained, moderately sloping to moderately steep soil is on side slopes and crests in the Arkansas Valley Uplands. Areas range from about 40 to more than 1,000 acres.

Typically, the surface layer is very dark grayish brown stony fine sandy loam that extends to a depth of about 3 inches. The upper part of the subsoil is strong brown stony loam that extends to a depth of about 8 inches. The middle part is yellowish red silty clay that extends to a depth of about 20 inches and yellowish red, mottled clay that extends to a depth of about 34 inches. The lower part is mottled red, gray, and strong brown silty clay and shaly silty clay that extends to a depth of about 52 inches. The underlying material is weathered shale.

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

Included with this soil in mapping are a few areas of Leadvale and Linker soils and a few areas of soils that are similar to Enders soils but are less than 40 inches deep to bedrock. Also included in this unit are a few areas of soils that do not have stones and have a gravelly surface layer.

This soil is unsuitable for cultivated crops because of a very severe hazard of erosion and stones on the surface.

This soil is poorly suited to use as pasture. Steepness of slope and large stones on the surface limit pasture management. If this soil is used for pasture, management concerns include proper stocking, controlled grazing, and weed and brush control. Pasture plants which grow well on this soil include bermudagrass and tall fescue.

This soil is moderately suited to use as woodland. Trees that commonly grow on this soil are southern red oak, white oak, and loblolly pine. Stones on the surface moderately limit the use of equipment in woodland management.

This soil is poorly suited to most urban uses. Its use as septic tank filter fields is severely limited by very slow permeability. Its use as sites for dwellings is severely limited by high shrink-swell potential. Its use as sites for small commercial buildings is severely limited by high shrink-swell potential and slope. The use of this soil as sites for local roads and streets is severely limited by high shrink-swell potential and low strength. Overcoming these limitations is usually difficult or impractical and requires special engineering design.

This soil is in capability unit VIs-1 and woodland suitability group 4x2.

11—Hebert silt loam, 0 to 1 percent slopes. This deep, somewhat poorly drained, level soil is on the lower parts of natural levees that border abandoned stream channels of the Arkansas River. Areas range from about 20 to more than 1,000 acres.

Typically, the surface layer is brown silt loam about 7 inches thick. The subsurface layer is grayish brown, mottled silt loam that extends to a depth of about 14 inches. The upper part of the subsoil is reddish brown, mottled silty clay loam that has grayish silt coatings and extends to a depth of about 27 inches. The middle part is reddish brown, mottled silt loam that has grayish silt coatings and extends to a depth of about 36 inches. The lower part is brown, mottled silt loam that extends to a depth of about 53 inches. The underlying material is reddish brown, mottled silt loam that extends to a depth of 72 inches or more.

This soil is moderate in natural fertility and low in organic matter content. Reaction ranges from strongly acid to slightly acid in the surface layer, from very strongly acid to slightly acid in the subsoil, and from strongly acid to mildly alkaline in the underlying material. Permeability is moderately slow, and the available water capacity is high. The water table is within about 2 to 3 feet of the surface in winter and early spring.

Included with this soil in mapping are a few small areas of Caspiana, Keo, Perry, Portland, and Rilla soils.

This soil is well suited to row crops and winter small grain. The main crops are cotton and soybeans. Grain sorghum is also grown on this soil. Wetness is a moderate limitation and may delay farming operations for a few days after a rain. Surface drains are needed in some areas. This soil responds well to fertilization, and tilth is easy to maintain by returning crop residue to the soil.

This soil is well suited to use as pasture and as hayland. Wetness moderately limits these uses during winter and early in spring. Pasture plants which grow well on this soil include bermudagrass, bahiagrass, and tall fescue.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are cherrybark oak, Nuttall oak, sweetgum, and pecan (fig. 1). Wetness moderately limits the use of equipment in managing and harvesting the tree crop. This limitation can be overcome by harvesting during the drier season.

This soil is moderately suited to poorly suited to most urban uses. The use of this soil as septic tank filter fields is severely limited by slow permeability and wetness. These limitations are usually difficult to overcome. The use of this soil as sites for dwellings and small commercial buildings is moderately limited by wetness and moderate shrink-swell potential. Its use as sites for local roads and streets is severely limited by low strength. These limitations can generally be overcome by drainage and proper engineering design.

This soil is in capability unit IIw-2 and woodland suitability group 2w5.

12—Jackport silty clay loam, 0 to 1 percent slopes. This deep, poorly drained, level soil is on terraces that were backswamps of former streams on bottom lands of the White River. Areas range from about 20 to more than 600 acres.

Typically, the surface layer is dark grayish brown silty clay loam about 4 inches thick. The upper part of the subsoil is grayish brown, mottled silty clay that extends to a depth of about 10 inches. The middle part is grayish brown, mottled clay and silty clay and extends to a depth of about 46 inches. The lower part of the subsoil is grayish brown, mottled silty clay loam that extends to a depth of about 55 inches. The underlying material is grayish brown, mottled silty clay loam that extends to a depth of 72 inches or more.

This soil is moderate in natural fertility and low in organic matter content. Reaction ranges from very strongly acid to medium acid in the surface layer. Reaction is very strongly acid or strongly acid in the upper part of the subsoil and ranges from very strongly acid to mildly alkaline in the lower part. Reaction in the underlying material ranges from slightly acid to moderately alkaline. Permeability is very slow, and the available water capacity is high. A perched high water table is within about 1 foot of the surface in winter and early in spring. This soil shrinks and cracks when dry, and the cracks seal when the soil is wet.

Figure 1.—A well managed pecan grove on Hebert silt loam, 0 to 1 percent slopes.

Included with this soil in mapping are a few areas of Crowley soils and a few areas where slopes exceed 1 percent.

This soil is well suited to rice and soybeans, and these are the main crops. Wetness commonly delays farming operations for several days after a rain. Surface drainage is needed. This soil responds well to fertilization. Tilth is difficult to maintain because of high clay content in the surface layer, and clods form on the surface if the soil is plowed when wet.

This soil is well suited to use as pasture and as hayland. Wetness is a limitation to these uses during winter and early in spring. Pasture plants that grow well on this soil include common bermudagrass and tall fescue.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are water oak, willow oak, sweetgum, and cherrybark oak. Wetness severely limits the use of equipment in managing and harvesting the tree crop. This limitation can be overcome by harvesting during the drier seasons.

This soil is poorly suited to most urban uses. Its use as septic tank filter fields is severely limited by very slow permeability and wetness. Its use as sites for dwellings, small commercial buildings, and local roads and streets is severely limited by wetness and high shrink-swell potential. Low strength is an additional severe limitation to the use of this soil as sites for local roads and streets. Overcoming these limitations is usually difficult or impractical.

This soil is in capability unit IIIw-2 and woodland suitability group 2w6.

13—Jackport silty clay loam, 1 to 3 percent slopes. This deep, poorly drained, nearly level soil is on terraces that were formerly backswamps of streams on bottom lands of the White River. Areas range from about 20 to about 300 acres.

Typically, the surface layer is dark grayish brown silty clay loam about 4 inches thick. The upper part of the subsoil is grayish brown, mottled silty clay that extends to a depth of about 10 inches. The middle part is grayish brown, mottled clay and silty clay that extends to a depth of about 46 inches. The lower part is grayish brown, mottled silty clay loam that extends to a depth of about 55 inches. The underlying material is grayish brown, mottled silty clay loam that extends to a depth of 72 inches or more.

This soil is moderate in natural fertility and low in organic matter content. The surface layer is very strongly acid to medium acid. The subsoil is very strongly acid to strongly acid in the upper part and very strongly acid to mildly alkaline in the lower part. Reaction in the underlying material ranges from slightly acid to moderately alkaline. Permeability is very slow, and the available water capacity is high. A perched high water table is within about 1 foot of the surface in winter and early in spring. The soil shrinks and cracks when dry, and these cracks seal when the soil is wet.

Included with this soil in mapping are a few areas of Muskogee soils and a few areas where slopes are more than 3 percent.

This soil is moderately suited to row crops. The main crop is soybeans. Runoff is medium, and erosion is a severe hazard. Practices such as minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion. This soil responds well to fertilization. Tilth is difficult to maintain because of high clay content in the surface layer, and clods form on the surface if the soil is plowed when wet.

This soil is well suited to use as pasture and as hayland. Wetness limits these uses during winter and early in spring. Pasture plants that grow well on this soil include common bermudagrass and tall fescue.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are water oak, willow, oak, sweetgum, and cherrybark oak. Wetness severely limits the use of equipment in managing and harvesting the tree crop. This limitation can be overcome by harvesting during the drier season.

This soil is poorly suited to most urban uses. Its use as septic tank filter fields is severely limited by very slow permeability and wetness. The use of this soil as sites for dwellings, small commercial buildings, and local roads and streets is severely limited by wetness and high shrink-swell potential. Low strength is an additional severe limitation to the use of this soil as sites for local roads and streets. Overcoming these limitations is usually difficult or impractical.

This soil is in capability unit IIIe-3 and woodland suitability group 2w6.

14—Keo silt loam, 0 to 1 percent slopes. This deep, well drained, level soil is on the higher parts of natural levees bordering abandoned stream channels of the Arkansas River. Areas range from about 40 to 600 acres.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsoil is dark brown silt loam that extends to a depth of about 30 inches. The underlying material is brown very fine sandy loam to a depth of about 48 inches. The next layer is dark brown silt loam that extends to a depth of about 54 inches. The next layer is brown very fine sandy loam that extends to a depth of 72 inches or more.

This soil is high in natural fertility and moderate in organic matter content. Permeability is moderate, and the available water capacity is high. Reaction ranges from slightly acid to moderately alkaline in the surface layer and from neutral to moderately alkaline in the underlying material.

Included with this soil in mapping are a few small areas of Caspiana and Hebert soils.

This soil is well suited to row crops and winter small grain. The main crops are cotton and soybeans. Grain sorghum is also grown on this soil. Few limitations restrict the use of this soil as cropland. This soil responds well to fertilization, and tilth is easy to maintain by returning crop residue to the soil.

This soil is well suited to use as pasture and as hayland. Pasture plants that grow well on this soil include bermudagrass, bahiagrass, lespedeza, and tall fescue.

This soil is well suited to use as woodland. Trees that commonly grow on this soil include sweetgum, southern red oak, black walnut, and green ash. There are no significant limitations to woodland use or management of this soil.

This soil is well suited to most urban uses. It has no significant limitations for most urban uses. Moderate permeability in this soil is a moderate limitation to its use as septic tank filter fields. This limitation can generally be overcome by increasing the size of the filter field.

This soil is in capability unit I-1 and woodland suitability group 2o4.

15—Keo silt loam, 1 to 3 percent slopes. This deep, well drained, nearly level soil is on the higher parts of natural levees bordering abandoned stream channels of the Arkansas River. Areas range from about 20 to 400 acres.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsoil is dark brown silt loam that extends to a depth of about 30 inches. The underlying material is brown very fine sandy loam to a depth of about 48 inches. The next layer is dark brown silt loam that extends to a depth of about 54 inches. The next layer is brown very fine sandy loam that extends to a depth of 72 inches or more.

This soil is high in natural fertility and moderate in organic matter content. Permeability is moderate, and the available water capacity is high. Reaction ranges from slightly acid to moderately alkaline in the surface layer and from neutral to moderately alkaline in the underlying material.

Included with this soil in mapping are a few small areas of Caspiana and Hebert soils.

This soil is well suited to row crops and winter small grain. The main crops are cotton and soybeans. Grain sorghum is also grown on this soil. Erosion is a moderate hazard if row crops are grown. Minimum tillage, contour farming, and the use of cover crops are practices that help reduce runoff and control erosion. This soil responds well to fertilization, and tilth is easy to maintain by returning crop residue to the soil.

This soil is well suited to use as pasture and as hayland. Pasture plants that grow well on this soil include bermudagrass, bahiagrass, lespedeza, and tall fescue.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are sweetgum, black walnut, southern red oak, and green ash. There are no significant limitations to woodland use or management of this soil.

This soil is well suited to most urban uses. It has no significant limitations for most urban uses. Moderate permeability is a moderate limitation if this soil is used as septic tank filter fields. This limitation can generally be overcome by increasing the size of the filter field.

This soil is in capability unit IIe-1 and woodland suitability group 2o4.

16—Kobel silty clay loam, 0 to 1 percent slopes. This deep, poorly drained, level soil is on broad flats and depressions that were backswamps of former streams of the White River and its tributaries. Areas range from about 40 to more than 1,000 acres.

Typically, the surface layer is dark grayish brown and very dark grayish brown silty clay loam that extends to a depth of about 4 inches. The upper part of the subsoil is dark gray, mottled silty clay that extends to a depth of about 20 inches. The lower part is gray, mottled silty clay that extends to a depth of about 56 inches. The underlying material is gray, mottled silty clay that extends to a depth of 72 inches or more.

This soil is high in natural fertility and moderate in organic matter content. Reaction ranges from medium acid to neutral in the surface layer, from slightly acid to moderately alkaline in the subsoil, and from neutral to moderately alkaline in the underlying material. Permeability is very slow, and the available water capacity is high. A perched high water table is within 1 foot of the surface in winter and early in spring. This soil shrinks and cracks when dry, and the cracks seal when the soil is wet.

Included with this soil in mapping are a few areas of Commerce soils and a few areas that are subject to flooding.

This soil is well suited to rice and soybeans, and these are the main crops. Wetness commonly delays farming operations for several days after a rain, and surface drains are needed. This soil responds well to fertilization. Tilth is difficult to maintain because of high clay content in the surface layer, and clods form on the surface if the soil is plowed when wet.

This soil is well suited to use as pasture and as hayland. Wetness is a limitation to these uses during winter and early in spring. Pasture plants that grow well on this soil include bermudagrass and tall fescue.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are green ash, cherrybark oak, sweetgum, water oak, and sycamore. Wetness severely limits the use of equipment in managing and harvesting the tree crop, but this limitation can generally be overcome by harvesting during the drier seasons.

This soil is poorly suited to most urban uses. Its use as septic tank filter fields is severely limited by very slow permeability and wetness. Its use as sites for dwellings, small commercial buildings, and local roads and streets is severely limited by wetness and high shrink-swell potential. Low strength is an additional severe limitation to its use as sites for local roads and streets. Overcoming these limitations is difficult or impractical.

This soil is in capability unit IIIw-2 and woodland suitability group 2w6.

17—Kobel silty clay loam, frequently flooded. This deep, poorly drained, undulating soil is on flood plains of the White River and its tributaries. These areas normally are flooded each year. Slopes range from 0 to 3 percent. Areas range from about 40 to more than 1,000 acres.

Typically, the surface layer is dark grayish brown and very dark grayish brown silty clay loam that extends to a depth of about 4 inches. The upper part of the subsoil is dark gray, mottled silty clay that extends to a depth of about 20 inches. The lower part is gray, mottled silty clay that extends to a depth of about 56 inches. The underlying material is gray, mottled silty clay that extends to a depth of 72 inches or more.

This soil is high in natural fertility and moderate in organic matter content. Reaction ranges from medium acid to neutral in the surface layer, from slightly acid to moderately alkaline in the subsoil, and from neutral to moderately alkaline in the underlying material. Permeability is very slow, and the available water capacity is high. A perched high water table is within 1 foot of the surface in winter and early in spring. Flooding is frequent and normally occurs between October and May. This soil shrinks and cracks when dry, and the cracks seal when the soil is wet.

Included with this soil in mapping are a few small areas of Commerce soils and a few small areas of soils that have a silty clay surface layer.

This soil is poorly suited to cultivated crops because of frequent flooding that occurs in most years. Crops that require a short growing season, such as soybeans, can be grown, but flooding is likely to damage the crop in some years.

This soil is moderately suited to use as pasture and as hayland. Wetness and flooding are the main limitations to these uses. Pasture plants that grow well on this soil include bermudagrass and tall fescue.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are green ash, sweetgum, water hickory, and water oak. Wetness and flooding severely limit the use of equipment in managing and harvesting the tree crop, but these limitations can be partially overcome by using special equipment and harvesting during the drier seasons.

This soil is severely limited for urban uses. Wetness, high shrink-swell potential, and flooding are severe limitations to its use as sites for dwellings, small commercial buildings, local roads and streets, and septic tank filter fields. Overcoming these limitations is difficult or impractical.

This soil is in capability unit IVw-2 and woodland suitability group 3w6.

18—Leadvale silt loam, 1 to 3 percent slopes. This deep, nearly level, moderately well drained soil is on toe slopes of ridges, benches, and terraces in the Arkansas Valley. Areas range from about 20 to 800 acres.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The upper part of the subsoil is strong brown silt loam and silty clay loam that extends to a depth of 20 inches. The middle part is yellowish brown, mottled silty clay loam that extends to a depth of 28 inches. The lower part is a brittle fragipan which is yellowish brown, mottled silty clay loam and silt loam that extends to a depth of 72 inches or more.

This soil is low in both natural fertility and organic matter content. This soil is very strongly acid or strongly acid except where it has been limed. Permeability is slow, and the available water capacity is medium. This soil has a compact, brittle fragipan at about 18 to 36 inches. The pan restricts the penetration of roots and the movement of water through the soil. A perched water table is within 2 to 3 feet of the surface in winter and early in spring.

Included with this soil in mapping are a few small areas of Enders, Sawyer, Sacul, and Taft soils and a few small areas of soils that are similar to Leadvale soils but have more sand in the profile.

This soil is well suited to row crops and winter small grain. The main crops are pasture, hay, and soybeans. Winter small grains and truck crops are also grown on this soil. Erosion is a moderate hazard if row crops are grown. Minimum tillage, contour farming, and the use of cover crops are practices that help reduce runoff and control erosion. This soil responds well to fertilization, and tilth is easy to maintain by returning crop residue to the soil.

This soil is well suited to use as pasture and as hayland. Pasture plants that grow well on this soil include bermudagrass, bahiagrass, and tall fescue.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are southern red oak, white oak, and loblolly pine. There are no significant limitations to woodland use or management.

This soil is moderately suited to most urban uses. Its use as septic tank filter fields is severely limited by slow permeability and wetness. Its use as sites for dwellings, small commercial buildings, and local roads and streets is moderately limited by wetness. Low strength is an additional moderate limitation to the use of this soil as sites for local roads and streets. These limitations can generally be overcome by proper engineering design and drainage.

This soil is in capability unit IIe-2 and woodland suitability group 3o7.

19—Leadvale silt loam, 3 to 8 percent slopes. This deep, gently sloping, moderately well drained soil is on toe slopes of ridges, benches, and terraces in the Arkansas Valley. Areas range from about 20 to more than 1,000 acres.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The upper part of the subsoil is strong brown silt loam and silty clay loam that extends to a depth of about 20 inches. The middle part is yellowish brown, mottled silty clay loam that extends to a depth of about 28 inches. The lower part of the subsoil is a brittle fragipan which is mottled yellowish brown, light brownish gray, and strong brown silty clay loam and silt loam that extends to a depth of 72 inches or more.

This soil is low in both natural fertility and organic matter content. This soil is very strongly acid or strongly acid except where it has been limed. Permeability is slow, and the available water capacity is medium. This soil has a compact, brittle fragipan at about 18 to 36 inches. The pan restricts the penetration of roots and the movement of water through the soil. A perched water table is within 2 to 3 feet of the surface in winter and early in spring.

Included with this soil in mapping are a few areas of Enders, Sawyer, Sacul, and Taft soils and a few areas of soils that are similar to Leadvale soils but have more sand in the profile.

This soil is used mainly for pasture, hay, and soybeans (fig. 2). It is moderately suited to row crops and winter small grains. Runoff is medium to rapid, and erosion is a severe hazard. Practices such as minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion. Conservation practices need to be intensified as slope length and gradient increase.

This soil is well suited to use as pasture and as hayland. Pasture plants that grow well on this soil include bermudagrass, bahiagrass, and tall fescue.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are loblolly pine, white oak, and southern red oak. There are no significant limitations to woodland use or management of this soil.

This soil is moderately suited to most urban uses. Its use as septic tank filter fields is severely limited by low permeability and wetness. Its use as sites for dwellings is moderately limited by wetness. Its use as sites for small commercial buildings is moderately limited by wetness and slope. Its use as sites for local roads and streets is moderately limited by wetness and low strength. These

Figure 2.—Pasture and loblolly pine on Leadvale silt loam, 3 to 8 percent slopes.

limitations can generally be overcome by proper engineering design and drainage.

This soil is in capability unit IIIe-1 and woodland suitability group 3o7.

20—Linker-Enders-Mountainburg complex, 12 to 25 percent slopes. This complex consists of moderately steep to steep, deep to shallow, well drained soils that formed in residuum of interbedded sandstone and shale. These soils are on narrow ridges and steep side slopes in the Arkansas Valley area. They are in an irregular pattern because of faulting and folding of the parent rock, but they generally occur in about the same relative proportions in each area. The soils are so intermingled that they could not be separated at the scale selected for mapping. Mapped areas range from about 80 to 800 acres.

The moderately deep Linker soils make up about 50 percent of each mapped area. Typically, the surface layer is dark brown stony fine sandy loam about 4 inches thick. The upper part of the subsoil is strong brown fine sandy loam that extends to a depth of about 12 inches. The middle part is yellowish red sandy clay loam that extends to a depth of about 28 inches. The lower part of the subsoil is yellowish red, mottled loam that extends to a depth of about 38 inches. Sandstone bedrock underlies the subsoil.

The Linker soils are low in natural fertility and low to moderate in organic matter content. Reaction ranges from very strongly acid to strongly acid throughout. Permeability is moderate, and the available water capacity is low. Because of the moderate depth to bedrock, plant rooting may be restricted and some areas may be droughty.

The deep Enders soils make up about 20 percent of each mapped area. Typically, the surface layer is dark grayish brown stony fine sandy loam about 3 inches thick. The upper part of the subsoil is strong brown stony loam that extends to a depth of about 8 inches. The middle part of the subsoil is yellowish red silty clay that extends to a depth of about 20 inches and yellowish red, mottled clay that extends to a depth of about 34 inches. The lower part of the subsoil is mottled red, gray, and strong brown shaly silty clay that extends to a depth of about 52 inches. The underlying material is weathered shale.

The Enders soils are low in natural fertility and moderate in organic matter content. Reaction is very strongly acid to strongly acid throughout. Permeability is very slow, and the available water capacity is medium.

The shallow Mountainburg soils make up about 20 percent of each mapped area. Typically, the surface layer is dark grayish brown stony fine sandy loam about 3 inches thick. The subsurface layer is yellowish brown stony fine sandy loam that extends to a depth of about 9 inches. The subsoil is strong brown very gravelly loam that extends to a depth of about 18 inches. It is underlain by sandstone bedrock.

The Mountainburg soils are low in natural fertility and low to moderate in organic matter content. Reaction is very strongly acid to strongly acid throughout. Permeability is moderately rapid, and the available water capacity is very low. Because of shallowness to bedrock, the soils are droughty and plant rooting may be restricted (fig. 3).

Included with these soils in mapping are soils which are similar to Linker soils but are deeper to bedrock and soils which are similar to Enders soils but are shallower to bedrock.

These soils are unsuitable for cultivated crops because of a very severe hazard of erosion and large stones on the surface. These soils are poorly suited to use as pasture. Steep slopes and large stones on the surface restrict the use of equipment in pasture management.

Linker soils are moderately suited to use as woodland. Trees that commonly grow on these soils are southern red oak, white oak, eastern redcedar, and loblolly pine. Slope and surface stoniness moderately limit the use of equipment in managing and harvesting the tree crop. Enders soils are moderately suited to use as woodland. Trees that commonly grow on these soils are red oak, white oak, eastern redcedar, and loblolly pine. Slope and surface stoniness moderately limit the use of equipment in harvesting and managing the tree crop. Mountainburg soils are poorly suited to use as woodland. Trees that commonly grow on these soils are eastern redcedar and loblolly pine. Surface stoniness severely limits the use of equipment on the Mountainburg soils.

The Linker soils have severe limitations for most urban uses. The use of these soils as septic tank filter fields is severely limited by slope and moderate depth to rock. The use of these soils as sites for dwellings, small commercial buildings, and local roads and streets is severely limited by slope.

The Enders soils have severe limitations for most urban uses. The use of these soils as septic tank filter fields is severely limited by slow permeability and slope. The use of these soils as sites for dwellings, small commercial buildings, and local roads and streets is severely limited by high shrink-swell potential and slope. Low strength is an additional severe limitation for local roads and streets.

The Mountainburg soils have severe limitations for most urban uses. The use of these soils as septic tank filter fields and as sites for dwellings, small commercial buildings, and local roads and streets is severely limited by shallowness to rock, slope, and large stones. These limitations are generally difficult or impractical to overcome.

Linker soils are in capability unit VIIs-1 and woodland suitability group 4x2. Enders soils are in capability unit VIIs-1 and woodland suitability group 4x2. Mountainburg soils are in capability unit VIIs-1 and woodland suitability group 5x3.

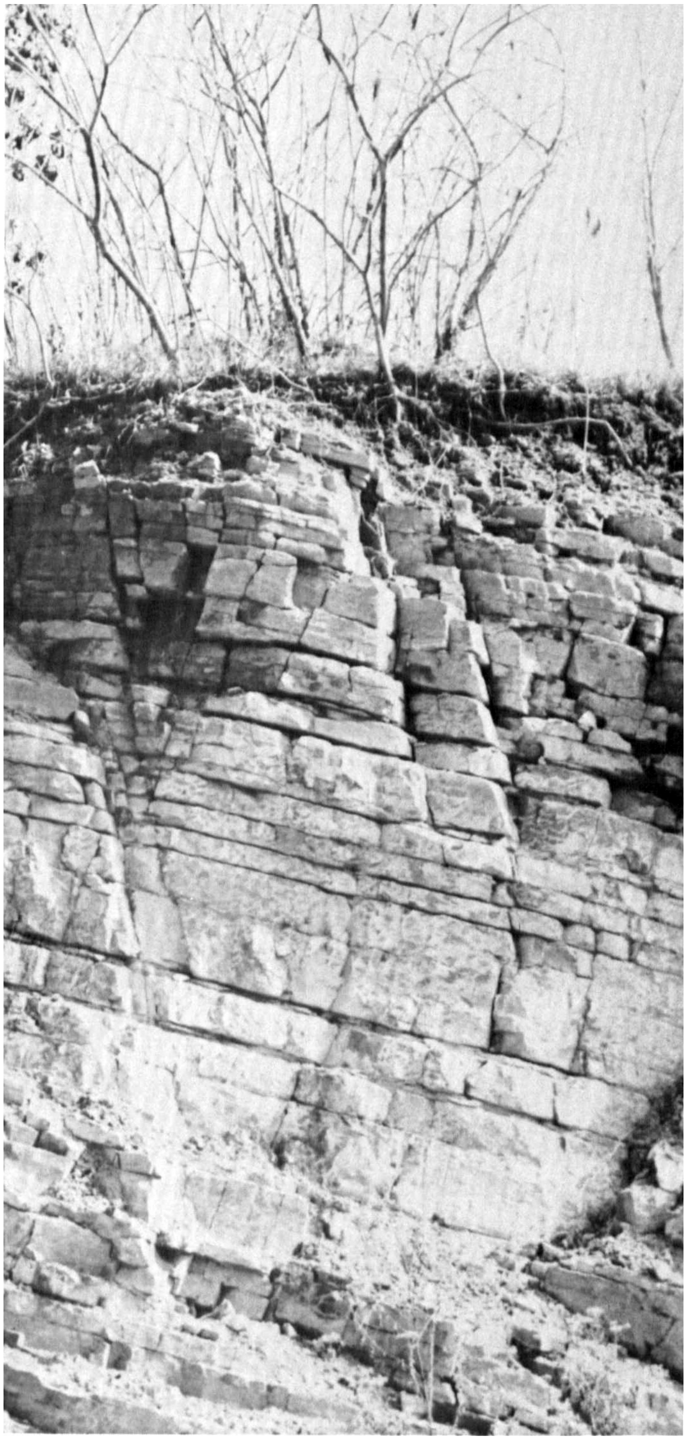


Figure 3.—Because of shallowness to bedrock, Mountainburg soils are droughty and rooting depth is restricted.

21—Loring silt loam, 1 to 3 percent slopes. This deep, nearly level, moderately well drained soil is on uplands and terraces in the Loess Hills and Loess Plains. Areas range from about 20 to more than 1,000 acres.

Typically, the surface layer is dark brown silt loam about 5 inches thick. The upper part of the subsoil is brown silt loam that extends to a depth of 10 inches, strong brown silty clay loam that extends to a depth of 20 inches, and yellowish brown, mottled silty clay loam that extends to a depth of 26 inches. The middle part is a brittle fragipan which is yellowish brown, mottled silty clay loam and silt loam that extends to a depth of 58 inches. The lower part of the subsoil is yellowish brown, mottled silt loam that extends to a depth of 72 inches or more.

This soil is moderate in natural fertility and low in organic matter content. Reaction in this soil ranges from very strongly acid to medium acid throughout. Permeability is moderate above the fragipan and moderately slow in the fragipan. The available water capacity is medium. The soil has a compact, brittle fragipan at a depth of about 22 to 30 inches. The pan restricts the penetration of roots and the movement of water through the soil. This soil has a perched water table within 2 to 3 feet of the surface in winter and early in spring.

Included with this soil in mapping are a few small areas of Calloway, Oaklimeter, and Stuttgart soils.

This soil is well suited to cultivated crops, and this is its main use. The main crop is soybeans. Cotton, grain sorghum, and winter small grain are also grown on this soil. Erosion is a moderate hazard if row crops are grown. Practices such as minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion. This soil responds well to fertilization, and tilth is easy to maintain by returning crop residue to the soil.

This soil is well suited to use as pasture and as hayland (fig. 4). Pasture plants which grow well on this soil include bermudagrass, bahiagrass, and tall fescue.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are cherrybark oak, sweetgum, southern red oak, and loblolly pine. There are no significant limitations to woodland use or management.

This soil is moderately suited to poorly suited to most urban uses. Its use as septic tank filter fields is severely limited by moderately slow permeability and wetness. Its use as sites for dwellings and small commercial buildings is moderately limited by wetness. Its use as sites for local roads and streets is severely limited by wetness. These limitations can generally be overcome by proper engineering design and drainage.

This soil is in capability unit IIe-2 and woodland suitability group 3o7.

22—Loring silt loam, 3 to 8 percent slopes. This deep, gently sloping, moderately well drained soil is on uplands in the Loess Hills. Areas range from about 20 to more than 1,000 acres.

Figure 4.—Pasture on Loring silt loam, 1 to 3 percent slopes, in foreground. Loring soils produce excellent forage for livestock.

Typically, the surface layer is dark brown silt loam about 5 inches thick. The upper part of the subsoil is brown silt loam that extends to a depth of 10 inches, strong brown silty clay loam that extends to a depth of 20 inches, and yellowish brown, mottled silty clay loam that extends to a depth of 26 inches. The middle part is a brittle fragipan which is yellowish brown, mottled silty clay loam and silt loam that extends to a depth of 58 inches. The lower part of the subsoil is yellowish brown, mottled silt loam that extends to a depth of 72 inches or more.

This soil is moderate in natural fertility and low in organic matter content. Reaction in this soil ranges from very strongly acid to medium acid throughout. Permeability is moderate above the fragipan and moderately slow in the fragipan. The available water capacity is medium. This soil has a compact, brittle fragipan at a depth of about 22 to 30 inches, which restricts the penetration of roots and the movement of water through the soil. This soil has a perched water table within 2 to 3 feet of the surface in winter and early in spring.

Included with this soil in mapping are a few small areas of Calloway, McKamie, Muskogee, and Oaklimeter soils and a few small areas which are eroded.

This soil is moderately suited to row crops and winter small grain. It is used mainly for soybeans, winter small grain, and pasture and hayland. Runoff is medium to rapid, and erosion is a severe hazard. Practices such as minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion. Conservation practices need to be intensified as slope length and gradient increase.

This soil is well suited to use as pasture and as hayland. Pasture plants which grow well on this soil include bermudagrass, bahiagrass, and fescue.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are cherrybark oak, sweetgum, southern red oak, and loblolly pine. There are no significant limitations to woodland use or management.

This soil is moderately suited to poorly suited to most urban uses. Its use as septic tank filter fields is severely limited by moderately slow permeability and wetness. Its use as sites for dwellings and small commercial buildings is moderately limited by wetness. Slope is an additional moderate limitation to the use of this soil as sites for small commercial buildings. Low strength is a severe limitation to the use of this soil as sites for local roads and streets. These limitations can generally be overcome by proper engineering design and drainage.

This soil is in capability unit IIIe-1 and woodland suitability group 3o7.

23—Loring-McKamie complex, 8 to 20 percent slopes. This complex consists of deep, moderately well drained and well drained, moderately sloping to moderately steep soils in a regular and repeating pattern. Areas of these soils could not be separated at the scale selected for mapping. Typically, the landscape is rolling hills that have narrow tops, moderately steep side slopes, and narrow drainageways. The Loring soils are on the narrow hilltops and the upper side slopes. The McKamie soils are on the lower side slopes. The Loring soils formed in loamy windblown deposits. The McKamie soils formed in red clayey alluvium. Areas range from about 80 to more than 1,000 acres.

The moderately well drained Loring soils make up about 50 percent of the map unit. Typically, the surface layer is dark brown silt loam about 5 inches thick. The upper part of the subsoil is brown silt loam that extends to a depth of about 10 inches, strong brown silty clay loam that extends to a depth of about 20 inches, and yellowish brown, mottled silty clay loam that extends to a depth of about 26 inches. The middle part is a brittle fragipan that is yellowish brown, mottled silty clay loam and silt loam that extends to a depth of about 58 inches. The lower part of the subsoil is yellowish brown, mottled silt loam that extends to a depth of 72 inches or more.

Loring soils are moderate in natural fertility and low in organic matter content. Permeability is moderate above the fragipan and moderately slow in the fragipan. The available water capacity is medium. These soils have a compact, brittle fragipan at a depth of about 22 to 30 inches, which restricts the penetration of roots and the movement of water through the soil. These soils have a perched water table within 2 to 3 feet of the surface in winter and early in spring.

The well drained McKamie soils make up about 30 percent of the map unit. Typically, the surface layer is dark brown silt loam about 3 inches thick. The upper part of the subsoil is red clay that extends to a depth of about 38 inches. The lower part of the subsoil is red silty clay loam that extends to a depth of about 51 inches. The underlying material is yellowish red and red, stratified silty clay loam and silt loam that extends to a depth of 72 inches or more.

McKamie soils are moderate in natural fertility and low in organic matter content. Reaction ranges from strongly acid to slightly acid in the surface layer. Reaction ranges from strongly acid to medium acid in the upper part of the subsoil and from medium acid to moderately alkaline in the lower part. Reaction in the underlying material ranges from medium acid to moderately alkaline. Permeability is very slow, and the available water capacity is high.

The remaining 20 percent of this complex consists of small areas of Muskogee, Oaklimeter, and Tichnor soils. Also included are a few small areas which are eroded.

These soils are poorly suited to cultivated crops because runoff is rapid to very rapid and the hazard of erosion is very severe.

These soils are moderately suited to use as pasture, and most of the acreage of these soils is in pasture and woodland. Slope and a hazard of erosion are the main limitations to the use of these soils as pasture. If these soils are used as pasture, management concerns include proper stocking, controlled grazing, and weed and brush control. Suited pasture plants include bermudagrass, bahiagrass, and tall fescue.

These soils are well suited to use as woodland. Trees that commonly grow on the Loring soils are cherrybark oak, sweetgum, southern red oak, and loblolly pine. Loblolly pine commonly grows on the McKamie soils. The Loring soils have no significant limitations to woodland use or management. Heavy clay in the subsoil of the McKamie soils causes seedling mortality and moderately limits the use of equipment on these soils.

These soils are poorly suited to most urban uses. The use of both the Loring and McKamie soils as septic tank filter fields is severely limited by slow permeability. Overcoming this limitation is difficult or impractical. The use of the Loring soils as sites for dwellings is moderately limited by wetness and slope. These limitations can generally be overcome by drainage and proper engineering design. The use of the Loring soils as sites for small commercial buildings is severely limited by slope. Their use as sites for local roads and streets is severely limited by low strength. Overcoming these limitations is difficult and requires special engineering design.

The use of the McKamie soils as sites for dwellings and small commercial buildings is severely limited by high shrink-swell potential. Slope is an additional severe limitation to the use of the McKamie soils as sites for small commercial buildings. The use of these soils as sites for local roads and streets is severely limited by low strength and high shrink-swell potential. Overcoming these limitations is generally difficult or impractical.

The Loring soils are in capability unit VIe-1 and in woodland suitability group 3o7. The McKamie soils are in capability unit VIe-1 and in woodland suitability group 3c2.

24—Moreland silty clay, 0 to 1 percent slopes. This deep, somewhat poorly drained, level soil is on broad flats that were backswamps of former streams of the Arkansas River. Areas range from about 40 to more than 800 acres.

Typically, the surface layer is dark brown silty clay about 4 inches thick. The subsurface layer is dark brown silty clay that extends to a depth of about 12 inches. The upper part of the subsoil is dark reddish brown, mottled silty clay that extends to a depth of about 23 inches. The middle part is reddish brown, mottled silty clay that extends to a depth of about 43 inches. The lower part is reddish brown, mottled silty clay loam that extends to a depth of 72 inches or more.

This soil is high in natural fertility and moderate in organic matter content. Reaction ranges from slightly acid to mildly alkaline in the surface layer and from neutral to moderately alkaline in the subsoil. Permeability is very slow, and the available water capacity is high. A perched high water table is within 1.5 feet of the surface in winter and early in spring. This soil shrinks and cracks when dry, and the cracks seal when the soil is wet.

Included with this soil in mapping are a few small areas of Perry and Portland soils. Also included are a few small areas of soils similar to Moreland soils that have a loamy subsoil below 30 inches.

This soil is well suited to rice and soybeans, which are the main crops. Grain sorghum and cotton are also grown on this soil. Wetness commonly delays farming operations for several days after a rain, and surface drains are needed. The soil responds well to fertilization. Tilth is difficult to maintain because of the high clay content in the surface layer, and clods form on the surface if the soil is plowed when wet.

This soil is well suited to use as pasture and as hayland. Wetness limits these uses during the winter and early in spring. Pasture plants that grow well on this soil include bermudagrass and tall fescue.

Catfish and minnow production are important enterprises in areas of this soil. Because included soils that have a loamy subsoil below 30 inches are in some areas, onsite investigations should be made before reservoirs are constructed.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are green ash, sweetgum, sycamore, and cherrybark oak. Wetness severely limits the use of equipment in managing and harvesting the tree crops, but can generally be overcome by harvesting during the drier seasons.

This soil is poorly suited to most urban uses. Its use as septic tank filter fields is severely limited by very slow permeability and wetness. Its use as sites for dwellings, small commercial buildings, and local roads and streets is severely limited by wetness and high shrink-swell potential. Low strength is an additional severe limitation to the use of this soil as sites for local roads and streets. Overcoming these limitations is difficult or impractical.

This soil is in capability unit IIIw-2 and woodland suitability group 2w6.

25—Muskogee silt loam, 3 to 8 percent slopes. This deep, gently sloping, moderately well drained soil is on uplands and terraces in the Loess Hills and Loess Plains. Areas range from about 20 to more than 1,000 acres.

Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The upper part of the subsoil is yellowish brown silty clay loam that extends to a depth of 16 inches. The middle part is yellowish brown, mottled silty clay loam that extends to a depth of 27 inches. The lower part is yellowish brown and light brownish gray, mottled silty clay that extends to a depth of 72 inches or more.

This soil is moderate in natural fertility and low in organic matter content. Reaction in the surface layer and upper subsoil ranges from very strongly acid to medium acid, and in the lower subsoil ranges from strongly acid to slightly acid. Permeability is slow, and available water capacity is high. A perched water table is within 1 to 2 feet of the surface in winter and early in spring.

Included with this soil in mapping are a few small areas of Crowley, Loring, and Stuttgart soils and a few small areas which are eroded.

This soil is moderately suited to cultivated crops and winter small grain. The major crop is soybeans. Runoff is medium and erosion is a severe hazard. Conservation practices such as contour farming, minimum tillage, and the use of cover crops that leave large amounts of residue help reduce runoff and control erosion. Conservation practices need to be intensified as slope length and gradient increase. This soil responds well to fertilization, and tilth is easy to maintain by returning crop residue to the soil.

This soil is well suited to use as pasture and as hayland. Pasture plants that grow well on this soil include bermudagrass, bahiagrass, and tall fescue.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are sweetgum, southern red oak, water oak, and loblolly pine. There are no significant limitations to woodland use or management of this soil.

This soil is poorly suited to most urban uses. Its use as septic tank filter fields is severely limited by slow permeability and wetness. Its use as sites for dwellings and small commercial buildings is severely limited by high shrink-swell potential and wetness. Its use as sites for local roads and streets is severely limited by low strength and high shrink-swell. These limitations are usually difficult to overcome and proper engineering design is needed.

This soil is in capability unit IIIe-1 and woodland suitability group 3o7.

26—Oaklimeter silt loam, occasionally flooded. This deep, level to nearly level, moderately well drained soil is on flood plains of streams in the Loess Hills. Slopes range from 0 to 2 percent. Areas range from about 10 to 300 acres.

Typically, the surface layer is dark brown silt loam about 5 inches thick. The upper part of the subsoil is brown silt loam that extends to a depth of about 14 inches. The middle part is yellowish brown, mottled silt loam that extends to a depth of about 36 inches. The lower part is light brownish gray, mottled silt loam that extends to a depth of 72 inches or more.

This soil is moderate in natural fertility and low in organic matter content. Reaction throughout is strongly acid or very strongly acid, except where the surface layer has been limed. Permeability is moderate, and the available water capacity is high. The water table is within 1.5 to 2.5 feet of the surface in winter and early in spring.

Included with this soil in mapping are a few small areas of Calloway, Loring, and Tichnor soils and a few soils that are similar to the Oaklimeter soil but have a browner subsoil. A few areas along Cypress Bayou are frequently flooded.

This soil is well suited to row crops. The main crop grown is soybeans. Cotton and grain sorghum can also be grown on this soil. Occasional flooding of short duration from November to April is a hazard. This soil responds well to fertilization, and tilth is easy to maintain by returning crop residue to the soil.

This soil is well suited to use as pasture and as hayland. The main limitation to these uses is flooding. Pasture plants that grow well on this soil include bermudagrass, tall fescue, and bahiagrass.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are cherrybark oak, green ash, loblolly pine, willow oak, and sweetgum. There are no significant limitations to woodland use or management of this soil.

This soil is severely limited for most urban uses. The use of this soil as septic tank filter fields and as sites for dwellings, small commercial buildings, and local roads and streets is severely limited by flooding. Wetness is an additional severe limitation to the use of this soil as septic tank filter fields. Overcoming these limitations is usually difficult or impractical.

This soil is in capability unit IIw-3 and woodland suitability group 1o7.

27—Perry silty clay, 0 to 1 percent slopes. This deep, poorly drained, level soil is on broad flats and in depressions that were backswamps of former streams on bottom lands of the Arkansas River. Areas range from about 40 to more than 1,000 acres.

Typically, the surface layer is dark gray, mottled silty clay about 4 inches thick. The upper part of the subsoil is gray, mottled clay that extends to a depth of about 23 inches. The middle part is dark gray, mottled clay that extends to a depth of about 34 inches. The lower part is reddish brown, mottled clay that extends to a depth of about 54 inches. The underlying material is reddish brown, mottled silty clay that extends to a depth of 72 inches or more.

This soil is high in natural fertility and moderate in organic matter content. Reaction in the surface layer is strongly acid or medium acid. Reaction in the subsoil ranges from strongly acid to neutral in the upper part and from slightly acid to moderately alkaline in the lower part. Reaction in the underlying material ranges from mildly alkaline to moderately alkaline. Permeability is very slow, and the available water capacity is high. The water table is within 2 feet of the surface in winter and early in spring. This soil shrinks and cracks when dry, and the cracks seal when the soil is wet.

Included with this soil in mapping are a few areas of Hebert, Moreland, Portland, Rilla, and Yorktown soils and a few areas of soils that are similar to Perry soils but have loamy material below a depth of 40 inches.

This soil is well suited to rice and soybeans, and these are the main crops. Wetness commonly delays farming operations for several days after a rain, and surface drains are needed. This soil responds well to fertilization. Tilth is difficult to maintain because of high clay content in the surface layer. Clods form on the surface if the soil is plowed when wet.

This soil is well suited to use as pasture and as hayland. Wetness limits this use during winter and early in spring. Pasture plants that grow well on this soil include bermudagrass and tall fescue.

Catfish and minnow production are also important enterprises in areas of this soil. Because included soils that have a loamy subsoil below a depth of 40 inches are in some areas, onsite investigations should be made before reservoirs are constructed.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are eastern cottonwood, green ash, sweetgum, and water oak. Wetness severely limits the use of equipment in managing and harvesting the tree crop, but this limitation is generally overcome by harvesting during the drier seasons.

This soil is poorly suited to most urban uses. Its use as septic tank filter fields is severely limited by very slow permeability and wetness. Its use as sites for dwellings, small commercial buildings, and local roads and streets is severely limited by wetness and high shrink-swell potential. Low strength is an additional severe limitation to the use of this soil as sites for local roads and streets. Overcoming these limitations is difficult or impractical.

This soil is in capability unit IIIw-2 and woodland suitability group 2w6.

28—Perry silty clay, frequently flooded. This deep, poorly drained, level soil is on broad flats and in depressions that were backswamps of former streams on bottom lands of the Arkansas River. These areas are flooded in most years. Slopes are 0 to 1 percent. Areas range from about 80 to more than 1,000 acres.

Typically, the surface layer is dark gray, mottled silty clay about 4 inches thick. The upper part of the subsoil is gray, mottled clay that extends to a depth of about 23 inches. The middle part is dark gray, mottled clay that extends to a depth of about 34 inches. The lower part is reddish brown, mottled clay that extends to a depth of about 54 inches. The underlying material is reddish brown, mottled silty clay that extends to a depth of 72 inches or more.

This soil is high in natural fertility and moderate in organic matter content. Reaction in the surface layer is strongly acid or medium acid. Reaction in the subsoil ranges from strongly acid to neutral in the upper part and from slightly acid to moderately alkaline in the lower part. Reaction in the underlying material ranges from mildly alkaline to moderately alkaline. Permeability is very slow, and the available water capacity is high. The water table is within 2 feet of the surface in winter and early spring. In most years, flooding occurs between December and May. This soil shrinks and cracks when dry, and the cracks seal when the soil is wet.

Included with this soil in mapping are a few small areas of Moreland, Portland, and Yorktown soils and a few areas of soils that are similar to Perry soils but have loamy material below a depth of 40 inches.

This soil is poorly suited to cultivated crops because of frequent flooding that occurs in most years. Crops such as soybeans, which require a short growing season, can be grown; but in some years, flooding is likely to damage the crop.

This soil is moderately suited to use as pasture and as hayland. Flooding and wetness during the winter and early in spring are the main limitations to these uses. Flooding may damage pasture and hay in some years. Pasture plants that grow well on this soil include bermudagrass and tall fescue.

This soil is well suited to use as woodland, and this is its main use. Trees that commonly grow on this soil are green ash, sweetgum, water oak, and water hickory. Wetness and flooding severely limit the use of equipment in managing and harvesting the tree crop, but these limitations can be partly overcome by using special equipment and harvesting during the drier seasons.

This soil is severely limited for urban uses. The use of this soil as septic tank filter fields is severely limited by wetness, flooding, and very slow permeability. Its use as sites for dwellings, small commercial buildings, and local roads and streets is severely limited by wetness, flooding, and very high shrink-swell potential. Low strength is an additional limitation to the use of this soil as sites for local roads and streets. Overcoming these limitations is difficult or impractical.

This soil is in capability unit IVw-2 and woodland suitability group 3w6.

29—Portland silty clay, 0 to 1 percent slopes. This deep, somewhat poorly drained, level soil is on broad flats that were backswamps of former streams on bottom lands of the Arkansas River. Areas range from about 40 to 600 acres.

Typically, the surface layer is dark brown silty clay about 3 inches thick. The upper part of the subsoil is brown, mottled clay that extends to a depth of about 14 inches. The middle part is reddish brown clay that extends to a depth of about 46 inches. The lower part is reddish brown silty clay loam that extends to a depth of about 62 inches. The underlying material is brown loam that has pockets or veins of reddish brown silty clay loam and extends to a depth of 72 inches or more.

This soil is moderate to high in natural fertility and moderate in organic matter content. Permeability is very slow, and the available water capacity is high. A perched high water table is within 12 inches of the surface in winter and early in spring. This soil shrinks and cracks when dry, and these cracks seal when wet.

Included with this soil in mapping are a few small areas of Hebert, Moreland, Perry, and Rilla soils and a few areas of soils that are similar to Portland soils but have loamy material below 30 inches.

This soil is well suited to rice and soybeans, which are the main crops (fig. 5). Cotton and grain sorghum are also grown on this soil. Wetness commonly delays farming operations for several days after a rain, and surface drains are needed. This soil responds well to fertilization. Tilth is difficult to maintain because of high clay content in the surface layer, and clods form on the surface if the soil is plowed when wet.

This soil is well suited to use as pasture and as hayland. Wetness limits these uses during winter and early in spring. Pasture plants which grow well on this soil include bermudagrass and tall fescue.

Catfish and minnow production are also important enterprises on areas of this soil. Because loamy material is in the lower part of the subsoil, onsite investigation should be made before reservoirs are constructed.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are green ash, cottonwood, and sweetgum. Wetness severely limits the use of equipment in managing and harvesting the tree crop, but this limitation can generally be overcome by using special equipment and harvesting during drier seasons.

This soil is poorly suited to most urban uses. Its use as septic tank filter fields is severely limited by very slow permeability and wetness. Its use as sites for dwellings, small commercial buildings, and local roads and streets is severely limited by high shrink-swell potential and wetness. Low strength is an additional severe limitation to the use of this soil as sites for local roads and streets. Overcoming these limitations is impractical or difficult.

This soil is in capability unit IIIw-2 and woodland suitability group 2w6.

30—Rilla silt loam, 0 to 1 percent slopes. This deep, well drained, level soil is on the higher parts of natural levees bordering abandoned stream channels on bottom lands of the Arkansas River. Areas range from about 40 to 400 acres.

Figure 5.—Rice ready for harvest on Portland silty clay, 0 to 1 percent slopes. Rice grows well on this soil.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsurface layer is brown silt loam that extends to a depth of about 12 inches. The upper part of the subsoil is reddish brown silty clay loam that has pale brown silt coatings and extends to a depth of about 38 inches. The lower part is yellowish red silt loam that extends to a depth of about 55 inches. The underlying material is yellowish red loam that extends to a depth of 72 inches or more.

This soil is moderate in natural fertility and low in organic matter content. Permeability is moderate, and the available water capacity is high. Reaction ranges from very strongly acid to neutral in the surface layer. Reaction in the subsoil is very strongly acid or strongly acid and ranges from strongly acid to mildly alkaline in the underlying material.

Included with this soil in mapping are a few areas of Caspiana, Hebert, Perry, and Portland soils.

This soil is well suited to row crops and winter small grain. The main crops are cotton and soybeans. Grain sorghum is also grown on this soil. Few limitations restrict the use of this soil as cropland. It responds well to fertilization, and tilth is easy to maintain by returning crop residue to the soil.

This soil is well suited to use as pasture and as hayland. Pasture plants that grow well on this soil include bermudagrass, bahiagrass, lespedeza, and tall fescue.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are cherrybark oak, Nuttall oak, sweetgum, pecan, and sycamore. There are no significant limitations to woodland use or management of this soil.

This soil is moderately suited to most urban uses. Its use as septic tank filter fields is moderately limited by moderate permeability. Its use as sites for dwellings and small commercial buildings is moderately limited by moderate shrink-swell potential. Its use as sites for local roads and streets is severely limited by low strength. These limitations can generally be overcome by proper engineering design.

This soil is in capability unit I-1 and woodland suitability group 2o4.

31—Rilla silt loam, 1 to 3 percent slopes. This deep, nearly level, well drained soil is on the higher parts of natural levees bordering abandoned stream channels on bottom lands of the Arkansas River. Areas range from about 40 to 400 acres.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsurface layer is brown silt loam that extends to a depth of about 12 inches. The upper part of the subsoil is reddish brown silty clay loam that has pale brown silt coatings and extends to a depth of about 38 inches. The lower part is yellowish red silt loam that extends to a depth of about 55 inches. The underlying material is yellowish red loam that extends to a depth of 72 inches or more.

This soil is moderate in natural fertility and low in organic matter content. Permeability is moderate, and the available water capacity is high. Reaction in the surface layer ranges from very strongly acid to neutral. Reaction in the subsoil is very strongly acid or strongly acid, and in the underlying material ranges from strongly acid to mildly alkaline.

Included with this soil in mapping are a few small areas of Caspiana, Hebert and Portland soils and a few areas where the slopes are greater than 3 percent.

This soil is well suited to row crops and winter small grain. The main crops are cotton and soybeans. Grain sorghum is also grown on this soil. Erosion is a moderate hazard if row crops are grown. Practices such as minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion. This soil responds well to fertilization. Tilth is easy to maintain by returning crop residue to the soil.

This soil is well suited to use as pasture and as hayland. Pasture plants that grow well on this soil include bermudagrass, bahiagrass, lespedeza, and tall fescue.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are cherrybark oak, Nuttall oak, sweetgum, pecan, and sycamore. There are no significant limitations to woodland use or management of this soil.

This soil is moderately suited to most urban uses. Its use as septic tank filter fields is moderately limited by moderate permeability. Its use as sites for dwellings and small commercial buildings is moderately limited by moderate shrink-swell potential. Its use as sites for local roads and streets is severely limited by low strength. These limitations can generally be overcome by proper engineering design.

This soil is in capability unit IIe-1 and woodland suitability group 2o4.

32—Sacul fine sandy loam, 3 to 8 percent slopes. This deep, gently sloping, moderately well drained soil is on uplands of the Coastal Plain. Areas range from about 20 to 500 acres.

Typically, the surface layer is dark brown fine sandy loam about 4 inches thick. The subsurface layer is yellowish brown fine sandy loam that extends to a depth of about 9 inches. The upper part of the subsoil is red silty clay that extends to a depth of about 20 inches. The middle part is red, mottled silty clay that extends to a depth of about 42 inches. The lower part is mottled light brownish gray, red, and yellowish brown silty clay loam that extends to a depth of about 56 inches. The underlying material is mottled light brownish gray, red, and strong brown, stratified fine sandy loam and clay loam that extends to a depth of 72 inches or more.

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

Included with this soil in mapping are a few small areas of Leadvale, Sawyer, and Smithdale soils.

This soil is poorly suited to cultivated crops. Runoff is medium to rapid, and erosion is a very severe hazard. Practices such as minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion. This soil responds well to fertilization, and tilth can be improved by returning crop residue to the soil.

This soil is well suited to use as pasture and as hayland and is used mainly for these purposes. Pasture plants that grow well on this soil include bermudagrass, bahiagrass, and tall fescue.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are loblolly pine and shortleaf pine. A moderate hazard of erosion moderately limits woodland management and use.

This soil is poorly suited to most urban uses. Its use as septic tank filter fields is severely limited by slow permeability. Its use as sites for dwellings, small commercial buildings, and local roads and streets is severely limited by high shrink-swell potential. Low strength is an additional severe limitation to the use of this soil as sites for local roads and streets. Overcoming these limitations is difficult or impractical and requires special engineering design.

This soil is in capability unit IVe-1 and woodland suitability group 3c2.

33—Sawyer silt loam, 3 to 8 percent slopes. This deep, gently sloping, moderately well drained soil is on uplands of the Coastal Plain. Areas range from about 20 to more than 1,000 acres.

Typically, the surface layer is dark brown silt loam about 5 inches thick. The upper part of the subsoil is yellowish brown silty clay loam that extends to a depth of about 18 inches. The middle part is yellowish brown, mottled silty clay loam that extends to a depth of about 32 inches. The lower part is mottled red, gray, and yellowish brown, silty clay and clay that extends to a depth of 72 inches or more.

This soil is low in both natural fertility and organic matter content. Reaction is very strongly acid or strongly acid throughout this soil. Permeability is slow, and the available water capacity is high. A perched water table is within 2 to 3 feet of the surface in winter and early in spring.

Included with this soil in mapping are a few small areas of Leadvale and Sacul soils and a few areas where the slopes are less than 3 percent.

This soil is moderately suited to cultivated crops. Runoff is medium, and erosion is a severe hazard. Practices such as minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion. Conservation practices need to be intensified as slope length and gradient increase. This soil responds well to fertilization, and tilth is easy to maintain by returning crop residue to the soil.

This soil is well suited to use as pasture and as hayland, and these are its main uses. Pasture plants which grow well on this soil include bahiagrass, bermudagrass, and tall fescue.

This soil is well suited to use as woodland. Trees which commonly grow on this soil are loblolly pine and shortleaf pine. Wetness moderately limits the use of equipment in managing and harvesting the tree crop. This limitation can be overcome by harvesting during the drier season.

This soil is poorly suited to most urban uses. Its use as septic tank filter fields is severely limited by slow permeability and wetness. Its use as sites for dwellings and small commercial buildings is severely limited by high shrink-swell potential. Its use as sites for local roads and streets is severely limited by low strength and high shrink-swell potential. Overcoming these limitations is generally difficult or impractical and special engineering design is needed.

This soil is in capability unit IIIe-2 and woodland suitability group 2w2.

34—Smithdale sandy loam, 5 to 8 percent slopes. This deep, gently sloping, well drained soil is on uplands of the Coastal Plain. Areas range from about 20 to 200 acres.

Typically, the surface layer is dark brown sandy loam about 4 inches thick. The subsurface layer is yellowish brown sandy loam that extends to a depth of about 12 inches. The upper part of the subsoil is yellowish red clay loam that extends to a depth of about 30 inches. The lower part is red sandy clay loam that extends to a depth of 72 inches or more.

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

Included with this soil in mapping are a few small areas of Leadvale and Sacul soils and a few areas where the slopes exceed 8 percent.

This soil is moderately suited to cultivated crops. Runoff is medium, and erosion is a severe hazard. Practices such as minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion. This soil responds well to fertilization, and tilth can be improved by returning crop residue to the soil.

This soil is well suited to use as pasture and as hayland and is used mainly for these purposes. Pasture plants that grow well on this soil include bermudagrass, bahiagrass, and tall fescue.

This soil is well suited to use as woodland. Loblolly pine grows on this soil. There are no significant limitations to woodland use.

This soil is well suited to most urban uses. There are no significant limitations to the use of this soil as sites for dwellings and local roads and streets. Moderate permeability is a moderate limitation to its use as septic tank filter fields. Slope is a moderate limitation to its use as sites for small commercial buildings. These limitations can usually be overcome by proper engineering design.

This soil is in capability unit IIIe-2 and woodland suitability group 3o1.

35—Stuttgart silt loam, 0 to 1 percent slopes. This deep, level, moderately well drained soil is on broad flats and terraces in the Loess Plains. Areas range from about 40 to 800 acres.

Typically, the surface layer is dark grayish brown silt loam about 5 inches thick. The upper part of the subsurface layer is grayish brown silt loam that extends to a depth of about 10 inches. The lower part is yellowish brown, mottled silt loam that extends to a depth of about 20 inches. The upper part of the subsoil is red, mottled silty clay that extends to a depth of about 31 inches. The middle part is grayish brown, mottled silty clay loam that extends to a depth of about 47 inches. The lower part is light brownish gray, mottled silty clay loam that extends to a depth of 72 inches or more.

This soil is moderate in natural fertility and low in organic matter content. Reaction in the surface and subsurface layers is strongly acid or medium acid. Reaction in the subsoil is strongly acid or medium acid in the upper part and ranges from strongly acid to mildly alkaline in the lower part. Permeability is very slow, and the available water capacity is high. A perched water table is within about 1 to 2 feet of the surface in winter and early in spring.

Included with this soil in mapping are a few areas of Crowley and Calloway soils. Also included in the northern part of the survey area are soils that are similar to Stuttgart soils but have less exchangeable sodium in the upper and middle parts of the subsoil.

This soil is well suited to cultivated crops and winter small grain. The major crops are rice and soybeans. Cotton is also grown on this soil. Wetness is a moderate limitation and may delay farming operations for several days after a rain. Surface drains are needed in some areas. This soil responds well to fertilization, and tilth is easy to maintain by returning crop residue to the soil. Exposure of the clayey subsoil is a moderate hazard if deep cuts are to be made in grading and smoothing, and depth to this layer should be determined before cuts are made.

This soil is well suited to use as pasture and as hayland. Pasture plants that grow well on this soil include bahiagrass, bermudagrass, and tall fescue.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are loblolly pine, cherrybark oak, and sweetgum. Wetness moderately limits the use of equipment in managing and harvesting the tree crop. This limitation can be overcome by harvesting during the drier season.

This soil is poorly suited to most urban uses. Its use as septic tank filter fields is severely limited by very slow permeability and wetness. Its use as sites for dwellings and small commercial buildings is severely limited by high shrink-swell potential and wetness. Its use as sites for local roads and streets is severely limited by high shrink-swell potential and low strength. Overcoming these limitations is generally difficult or impractical.

This soil is in capability unit IIw-1 and woodland suitability group 3w8.

36—Stuttgart silt loam, 1 to 3 percent slopes. This deep, nearly level, moderately well drained soil is on terraces in the Loess Plains. Areas range from about 20 to about 400 acres.

Typically, the surface layer is dark grayish brown silt loam about 5 inches thick. The upper part of the subsurface layer is grayish brown silt loam that extends to a depth of about 10 inches. The lower part is yellowish brown, mottled silt loam that extends to a depth of about 20 inches. The upper part of the subsoil is red, mottled silty clay that extends to a depth of about 31 inches. The middle part is grayish brown, mottled silty clay loam that extends to a depth of about 47 inches. The lower part is light brownish gray, mottled silty clay loam that extends to a depth of 72 inches or more.

This soil is moderate in natural fertility and low in organic matter content. Reaction in the surface and subsurface layers is strongly acid or medium acid except where the soil has been limed. Reaction in the subsoil is strongly acid or medium acid in the upper part and ranges from strongly acid to mildly alkaline in the lower part. Permeability is very slow, and the available water capacity is high. A perched water table is within about 1 to 2 feet of the surface in winter and early in spring.

Included with this soil in mapping are a few areas of Crowley, Loring, and Muskogee soils. Also included are soils in northern parts of the survey area that are similar to Stuttgart soils but have less exchangeable sodium in the upper and middle parts of the subsoil.

This soil is well suited to cultivated crops and winter small grain. The major crop is soybeans. Rice and cotton are also grown on this soil. Erosion is a moderate hazard if row crops are grown. Practices such as minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion. This soil responds well to fertilization, and tilth is easy to maintain by returning crop residue to the soil.

This soil is well suited to use as pasture and as hayland. Pasture plants that grow well on this soil include bahiagrass, bermudagrass, and tall fescue.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are loblolly pine, cherrybark oak, and sweetgum. There are no significant limitations to woodland use or management.

This soil is poorly suited to most urban uses. Its use as septic tank filter fields is severely limited by very slow permeability and wetness. Its use as sites for dwellings and small commercial buildings is severely limited by high shrink-swell potential and wetness. Its use as sites for local roads and streets is severely limited by low strength and high shrink-swell potential. Overcoming these limitations is generally difficult or impractical.

This soil is in capability unit IIe-3 and woodland suitability group 3o7.

37—Taft silt loam, 0 to 2 percent slopes. This deep, level to nearly level, somewhat poorly drained soil is on upland flats and terraces in the Arkansas Valley. Areas range from about 20 to more than 400 acres.

Typically, the surface layer is brown silt loam about 6 inches thick. The upper part of the subsoil is yellowish brown, mottled silt loam that extends to a depth of about 28 inches. Below this is a layer of light yellowish brown and light brownish gray, mottled silt loam that extends to a depth of about 32 inches. The middle part is a yellowish brown, mottled silt loam fragipan that extends to a depth of about 60 inches. The lower part is a mottled yellowish brown, gray, and strong brown silt loam fragipan that extends to 72 inches or more.

This soil is low in both natural fertility and organic matter content. Reaction is very strongly acid or strongly acid throughout this soil except where it has been limed. Permeability is slow, and the available water capacity is medium. A perched high water table is within about 1 or 2 feet of the surface during the winter and early in spring. This soil has a compact, brittle fragipan at about 20 to 36 inches. The pan restricts the penetration of roots and the movement of water through the soil.

Included with this soil in mapping are a few small areas of Amy, Leadvale, Oaklimeter soils and a few areas of soils that are similar to the Taft soil but have more clay in the subsoil.

This soil is moderately suited to row crops. It is used mainly for pasture, hay, and soybeans. Winter small grain can be grown if surface drainage is adequate. Wetness is a moderate limitation and may delay farming operations for a few days after a rain. This soil responds well to fertilization, and tilth is easy to maintain by returning crop residue to the soil.

This soil is well suited to use as pasture and as hayland. Wetness is a limitation to these uses during the winter and early in spring. Pasture plants that grow well on this soil include bermudagrass, bahiagrass, and tall fescue.

This soil is well suited to use as woodland. Trees that commonly grow on this soil are loblolly pine, sweetgum, and white oak. Wetness moderately limits the use of equipment in managing and harvesting the tree crop, but can be overcome by harvesting during the drier season.

This soil is poorly suited to most urban uses. Its use as septic tank filter fields is severely limited by slow permeability and wetness. Its use as sites for dwellings and small commercial buildings is severely limited by wetness. Its use as sites for local roads and streets is severely limited by low strength. Overcoming these limitations is generally difficult or impractical.

This soil is in capability unit IIIw-3 and in woodland suitability group 3w8.

38—Tichnor silt loam, frequently flooded. This deep, level, poorly drained soil is on flood plains of streams in the Loess Hills and Loess Plains. These areas are normally flooded each year. Slopes are 0 to 1 percent. Areas range from about 80 to more than 1,000 acres.

Typically, the surface layer is dark grayish brown silt loam about 5 inches thick. The subsurface layer is light brownish gray and gray, mottled silt loam that extends to a depth of about 30 inches. The upper part of the subsoil is light brownish gray, mottled silty clay loam that extends to a depth of about 41 inches. The middle part is gray, mottled silty clay loam that extends to a depth of about 68 inches. The lower part is light gray, mottled silt loam that extends to a depth of 72 inches or more.

This soil is moderate in both natural fertility and organic matter. Reaction ranges from very strongly acid to medium acid throughout this soil. Permeability is slow, and the available water capacity is high. A perched water table is within 1 foot of the surface in winter and early in spring.

Included with this soil in mapping are a few small areas of Oaklimeter soils. Also included are soils that are similar to Tichnor soils but have surface and subsurface layers that have a total thickness of less than 20 inches. Also included are a few areas of soils that are similar to Tichnor soils but have more clay in the subsoil.

This soil is poorly suited to cultivated crops because of frequent flooding that occurs in most years. Crops such as soybeans that require a short growing season can be grown, but in some years flooding is likely to damage the crop.

This soil is moderately suited to use as pasture and as hayland. Flooding and wetness are the main limitations to these uses during the winter and early in spring. Pasture plants that grow well on this soil include bermudagrass and tall fescue. Flooding may damage pasture and hay in some years.

This soil is well suited to use as woodland. Commonly, trees that grow on this soil are cottonwood, cherrybark oak, sweetgum, sycamore, green ash, and water oak. Wetness and flooding severely limit the use of equipment in managing and harvesting the tree crop. These limitations can be partly overcome by using special equipment and harvesting during the drier seasons.

This soil is severely limited for urban uses. Its use as septic tank filter fields and as sites for dwellings, small commercial buildings, and local roads and streets is severely limited by wetness and flooding. Slow permeability is an additional limitation to the use of this soil as septic tank filter fields. Overcoming these limitations is difficult or impractical.

This soil is in capability unit IVw-3 and woodland suitability group 1w6.

39—Yorktown silty clay. This deep, level, very poorly drained soil is on low, ponded backswamps and abandoned oxbows in bottom lands of the Arkansas River. Slope is 0 to 1 percent. Areas range from about 40 to 200 acres.

Typically, the surface layer is gray, mottled silty clay about 6 inches thick. It is normally covered by about 2 inches of partly decomposed leaves, twigs, and roots. The upper part of the subsoil is gray, mottled clay that extends to a depth of about 28 inches. The middle part is dark gray, mottled clay that extends to a depth of about 44 inches. The lower part is reddish brown, mottled clay that extends to a depth of 60 inches or more.

This soil is high in both natural fertility and organic matter content. Permeability is very slow, and the available water capacity is medium. This soil is normally under 6 inches or more of water at least 10 months of most years. This soil has a very high shrink-swell potential but does not crack because it is wet most of the time.

Included with this soil in mapping are a few areas of Perry soils and a few small areas that have a silt loam overwash.

This soil is unsuitable for use as cropland and as pasture because of wetness, duration of flooding, and ponding.

This soil is moderately suited to use as woodland. Trees that commonly grow on this soil are baldcypress, water tupelo, and water hickory. Duration of flooding severely limits the use of equipment in managing and harvesting the tree crop.

This soil is well suited to use as shallow water wildlife habitat and is used mainly for this purpose (fig. 6).

This soil is severely limited for urban use because of ponding, very high shrink-swell potential, and flooding.

This soil is in capability unit VIIw-1 and woodland suitability group 4w6.

Figure 6.—Flooded area of Yorktown silty clay. This soil is under water at least 10 months of most years and is best suited to shallow water wildlife habitat.

prime farmland

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to producing food, feed, forage, fiber, and oilseed crops to meet the nation's short and long range needs. It has the soil quality, growing season, and moisture supply needed to economically produce a sustained high yield of crops when 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.

Prime farmland is either currently used for producing food or fiber or is available for this use. Urban or built-up land or water areas are not included. Urban and built-up land includes any unit of land of 10 acres or more in size that is used for residences, industrial sites, commercial sites, construction sites, institutional sites, railroad yards, small parks, cemeteries, airports, golf courses, sanitary landfills, sewage treatment plants, water-control structures and spillways, shooting ranges, and so forth.

Prime farmland usually has an adequate and dependable supply of moisture from precipitation or irrigation. It also has favorable temperature and growing season and acceptable reaction. It has few or no rocks and is permeable to water and air. Prime farmland is not excessively erodible or saturated with water for long periods and is not frequently flooded during the growing season. The slope ranges mainly from 0 to 6 percent. For more detailed information on the criteria for prime farmland, consult the local staff of the Soil Conservation Service.

In Lonoke County, about 375,000 acres, or nearly 75 percent of the county, meets the soil requirements for prime farmland. Most of the prime farmland is in the southern two-thirds of Lonoke County. Approximately 250,000 acres of this prime farmland is used for crops. The main crops grown on this land are cotton, rice, and soybeans.

In Prairie County, about 303,700 acres, or about 72 percent of the county, meets the soil requirements for prime farmland. Areas are scattered throughout the county. Approximately 240,000 acres of this prime farmland is used for crops. The main crops grown on this land are rice and soybeans.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal land, which generally is more erodible, droughty, and difficult to cultivate and commonly less productive.

Soil map units that make up prime farmland in Lonoke and Prairie Counties are listed in this section. This list does not constitute a recommendation for a particular land use. The extent of each map unit is shown in table 6. The location of each map unit is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described in the section "Detailed soil map units".

The map units which make up prime farmland in Lonoke County are:

2—Calhoun silt loam, 0 to 1 percent slopes
3—Calloway silt loam, 0 to 1 percent slopes
4—Caspiana silt loam, 0 to 1 percent slopes
7—Crowley silt loam, 0 to 1 percent slopes
11—Hebert silt loam, 0 to 1 percent slopes
14—Keo silt loam, 0 to 1 percent slopes
15—Keo silt loam, 1 to 3 percent slopes
18—Leadvale silt loam, 1 to 3 percent slopes
21—Loring silt loam, 1 to 3 percent slopes
24—Moreland silty clay, 0 to 1 percent slopes
26—Oaklimeter silt loam, occasionally flooded
27—Perry silty clay, 0 to 1 percent slopes
29—Portland silty clay, 0 to 1 percent slopes
30—Rilla silt loam, 0 to 1 percent slopes
31—Rilla silt loam, 1 to 3 percent slopes
35—Stuttgart silt loam, 0 to 1 percent slopes
36—Stuttgart silt loam, 1 to 3 percent slopes
37—Taft silt loam, 0 to 2 percent slopes

The map units which make up prime farmland in Prairie County are:

2—Calhoun silt loam, 0 to 1 percent slopes
3—Calloway silt loam, 0 to 1 percent slopes
5—Commerce silt loam, 0 to 1 percent slopes
7—Crowley silt loam, 0 to 1 percent slopes
8—Dubbs silt loam, 0 to 1 percent slopes
9—Dubbs silt loam, 1 to 3 percent slopes
12—Jackport silty clay loam, 0 to 1 percent slopes
13—Jackport silty clay loam, 1 to 3 percent slopes
16—Kobel silty clay loam, 0 to 1 percent slopes
21—Loring silt loam, 1 to 3 percent slopes
26—Oaklimeter silt loam, occasionally flooded
27—Perry silty clay, 0 to 1 percent slopes
35—Stuttgart silt loam, 0 to 1 percent slopes
36—Stuttgart silt loam, 1 to 3 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 rangeland and 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

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 1974, the Census of Agriculture reported that about 320,000 acres in Lonoke County and about 256,000 acres in Prairie County were used for crops and pasture (*8*). In Lonoke County, about 260,000 acres was harvested cropland, and in Prairie County, about 232,000 acres was harvested cropland.

The potential of the soils in Lonoke and Prairie Counties for increased production of food is good. Food production could be increased considerably by extending the latest crop production technology to all cropland in the survey area. This soil survey can greatly help in the application of such technology.

Acreage in crops and pasture has gradually been decreasing as more and more land is used for urban development and other uses. The use of this soil survey to help make land use decisions that will influence the future of farming in the county is discussed in the section "General soil map units".

Crops—Erosion control is needed on sloping soils that are used for clean-tilled crops. Control measures include contour cultivation, terraces, or grassed waterways, or combinations of these measures. Leaving a good mulch from harvested crops on the surface as long as possible before planting and using as little weed control tillage as necessary are also important in reducing erosion.

Annual cover crops or grasses and legumes should be grown regularly if the hazard of erosion is severe or if the crops grown leave only small amounts of residue. Row arrangement and suitable surface drainage are needed for dependable growth in wet areas. In many areas that are subject to frequent flooding, the soils are not suited or are only marginally suited to most crops commonly grown in the county.

A plowpan commonly develops in loamy soils that are improperly tilled or that are tilled frequently with heavy equipment. Keeping tillage to a minimum, varying the depth of tillage, and tilling only when soil moisture content is favorable help prevent formation of a plowpan. Growing deep-rooted grasses and legumes helps break up the plowpan.

If left bare, many soils tend to puddle, pack, and crust during periods of heavy rainfall. Growing cover crops and leaving crop residue on the soil help preserve or improve tilth.

Pasture—Perennial grasses or legumes, or mixtures of these, are grown for pasture and hay. The mixtures generally consist of either a summer or a winter perennial grass and a suitable legume.

Coastal bermudagrass, common bermudagrass, and Pensacola bahiagrass are the summer perennials most commonly grown. Coastal bermudagrass and Pensacola bahiagrass produce good quality forage. Tall fescue, the chief winter perennial grass now grown in the survey area, grows well only on soils that have favorable soil-moisture content. All of these grasses respond well to fertilizer, particularly to nitrogen. White clover, crimson clover, annual lespedeza, and sericea lespedeza are the most commonly grown legumes.

Proper grazing is essential for high quality forage, stand survival, and erosion control. Brush and weed control, fertilization, and renovation of the pasture are also important.

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 7. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

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

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

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 7 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the 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. 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.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-4 or IIIe-6.

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

woodland management and productivity

Paul I. Brown, forester, Soil Conservation Service, helped prepare this section.

When the first settlers arrived in Lonoke and Prairie Counties, they found most of the land covered by virgin forest. There were, however, sizeable areas in east-central Lonoke County and the southern part of Prairie County that were treeless. These areas were covered by native prairie grasses. A few small wooded areas were scattered throughout these areas. Principal trees of commercial value in the bottom lands on such soils as Commerce, Kobel, Perry, and Tichnor were broadleaved species, including oaks, sweetgum, water tupelo, baldcypress, ash, sycamore, and pecan. Principal trees of commercial value in the upland areas on such soils as Enders, Linker, and Loring were mostly broadleaved species with a few scattered stands of needleleaved species, principally shortleaf pine and eastern redcedar.

According to an unpublished report by the Southern Forest Experiment Station, forests covered about 154,000 acres or 16 percent of the survey area in 1978. About 15,000 acres of this forestland is within the boundaries of the Wattensaw Wildlife Management Area, which is administered by the Arkansas Game and Fish Commission. The remaining forested acreage is owned by private, non-industrial landowners.

A majority of the forestland in the survey area is either not managed or managed at a low level. Due to the general lack of management and to the limited acreage of forestland, the economic impact of forest products in the area is small. Products produced in the area include lumber for furniture, cross ties, fenceposts, handles, and fuel wood.

Table 8 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the woodland suitability group symbol for each soil. Soils assigned the same woodland suitability group symbol require the same general management and have about the same potential productivity.

The first part of the *woodland suitability group* 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.

The third part of the symbol, a numeral, indicates the kind of trees for which the soils in the group are best suited and also indicates the severity of the hazard or limitation. The numerals 1, 2, and 3 indicate slight, moderate, and severe limitations, respectively, and suitability for needleleaf trees. The numerals 4, 5, and 6 indicate slight, moderate, and severe limitations, respectively, and suitability for broadleaf trees. The numerals 7, 8, and 9 indicate slight, moderate, and severe limitations, respectively, and suitability for both needleleaf and broadleaf trees.

In table 8, *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.

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. It was calculated at 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, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

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 9 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public 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 9, 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 9 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

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

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

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

Paths and trails for hiking, 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.

wildlife habitat

Ray Linder, biologist, Soil Conservation Service, helped prepare this section.

Lonoke and Prairie Counties contain a variety of fish and wildlife habitats. Habitats include cropland, pastureland, wetlands, upland forest, streams, and lakes. The two counties have historically supported large concentrations of wintering waterfowl and resident species of wildlife and fish.

Lonoke and Prairie Counties consist mostly of large continuous fields of soybeans, cotton, rice, and other small grain. In many areas, field borders of natural vegetation have been eliminated. This lack of cover adjacent to crop fields has greatly reduced the area's ability to support desirable populations of quail, cottontail, and many species of songbirds. The elimination of field borders has also reduced nesting cover for doves; however, this migratory bird is well adapted to feeding in the many fields of small grain. During winter months, large numbers of waterfowl are attracted to harvested fields of soybeans, rice, and other small grains.

Pastureland is common in upland areas of the two counties. Most pastures are relatively small in comparison to crop fields. These pasture areas are surrounded by woodland, grass, and shrub borders which provide excellent food and cover for wildlife such as quail, cottontail, songbirds, and whitetail deer.

Larger tracts of forestland habitat are in the uplands and along major rivers. The Arkansas Game and Fish Commission owns 17,400 acres of land, mostly wooded, in the Wattensaw Wildlife Management Area in Prairie County. This area is bordered on the east by the White River and provides hunting and fishing. Areas of privately owned forested habitat are generally small, less than 100 acres.

Forestland plant communities are quite varied. Permanently flooded forested wetlands are dominated by cypress and tupelo gum. These areas provide habitat for wood duck, mink, beaver, herons, egrets, and other wildlife which require permanently flooded forestland.

Seasonally flooded bottomland hardwoods are found along the broad flood plains formed by the Arkansas and White Rivers and their major tributaries. Major tree species include water oak, willow oak, overcup oak, Nuttall oak, and water hickory. These areas are highly productive habitat for whitetail deer, fox and gray squirrel, cottontail rabbit, swamp rabbit, beaver, mink, raccoon, opossum, eastern wild turkey, wood duck, mallards, and a variety of other birds and small mammals, and reptiles, and amphibians.

Dominant tree species in uplands include blackjack oak, post oak, black hickory, and winged elm on driest sites. Southern red oak, white oak, and mockernut hickory are common species on moist upland slopes and loessial terraces. Along infrequently flooded narrow flood plains of the uplands, tree species such as red maple, river birch, American elm, sycamore, and cottonwood occur frequently. Cottontail rabbit, gray and fox squirrel, whitetail deer, and eastern wild turkey are the most common game species found in the uplands.

Of the vegetative communities which exist in the two counties, the Grand Prairie deserves special mention. This area is now almost entirely given over to crop production. Early settlers in Arkansas described the dominant vegetation of this area as grassland rather than trees. The reasons for this grassland dominance have not been established.

Fishing opportunities are provided by 313 miles of streams, 31,947 acres of lakes, and 3,676 acres of farm ponds. Major sport and commercial fish include bluegill, white crappie, largemouth bass, spotted bass, channel catfish, blue catfish, flathead catfish, bigmouth buffalo, and smallmouth buffalo.

With respect to total area in commercial fish culture operations, Lonoke and Prairie Counties rank as the top two counties in the State. In 1978, 14,300 acres in Lonoke County was devoted to the production of baitfish, and 700 acres was devoted to catfish. In Prairie County, 3,720 acres was devoted to baitfish and 584 acres to catfish.

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

In table 10, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

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

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

Coniferous plants furnish browse, 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, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cordgrass, rushes, sedges, and reeds.

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

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

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include bobwhite quail, meadowlark, field sparrow, cottontail, and red fox.

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

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

engineering

James L. Janski, assistant state conservation engineer, Soil Conservation Service, helped prepare this section.

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

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic supporting capacity.

sanitary facilities

Table 12 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 12 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 12 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 12 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 13 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

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

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help 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 13, 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 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas 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.

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 15 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 (*6*). 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 (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (*1*).

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

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

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

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an 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 16 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.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage 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 16, 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 17 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 17 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 the average, no more than once 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 17 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 17.

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.

classification of the soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*7*). 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 18, 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 Alfisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aqualf (*Aqu*, meaning water, plus *alf*, from Alfisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; 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 Hapludalf (*Hapl*, meaning minimal horizonation, plus *udalf*, the suborder of the Alfisols that have an udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Hapludalfs.

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-silty, mixed, thermic Typic Hapludalfs.

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 (*6*). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (*7*). 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."

Amy series

The Amy series consists of deep, poorly drained, slowly permeable, level soils that formed in loamy alluvium. These soils are on flood plains of the Coastal Plains. They are saturated late in winter and early in spring. The native vegetation under which these soils formed was mixed hardwood forest. Slopes are 0 to 1 percent.

Amy soils are geographically associated with Leadvale and Taft soils. Leadvale soils, which are on uplands and terraces at higher elevations, have a fragipan and are moderately well drained. Taft soils, which are on upland flats and terraces at higher elevations, have a fragipan and are somewhat poorly drained.

Typical pedon of Amy silt loam, frequently flooded, in a field in the SW1/4SW1/4SE1/4 sec. 9, T. 3 N., R. 9 W., Lonoke County:

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; common fine distinct grayish brown mottles; weak medium granular structure; friable; common fine roots; few fine dark concretions; strongly acid; clear smooth boundary.

A2g—4 to 19 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct yellowish brown (10YR 5/4, 5/6) and faint gray (10YR 6/1) mottles; weak medium subangular blocky structure; friable; few fine roots; common fine dark concretions; very strongly acid; clear smooth boundary.

B2tg—19 to 46 inches; light brownish gray (10YR 6/2) silty clay loam; common medium distinct yellowish brown (10YR 5/4, 5/6) and faint gray (10YR 6/1) mottles; moderate medium subangular blocky structure; firm; patchy distinct clay films on faces of peds; common pockets and streaks of light gray silt; few fine dark concretions; very strongly acid; gradual wavy boundary.

B3g—46 to 66 inches; gray (10YR 6/1) silty clay loam; common medium distinct strong brown (7.5YR 5/6) and yellowish brown (10YR 5/4, 5/6) mottles; patchy distinct clay films on faces of peds; common pockets and streaks of light gray silt; few fine dark concretions; very strongly acid; gradual wavy boundary.

Cg—66 to 72 inches; gray (10YR 6/1) silt loam; common medium distinct strong brown (7.5YR 5/6) and yellowish brown (10YR 5/4, 5/6) mottles; massive; friable; few fine dark concretions; very strongly acid.

The solum thickness ranges from 50 to 72 inches or more. Reaction is very strongly acid or strongly acid throughout.

The combined thickness of the A horizon ranges from about 10 to 24 inches. The A1 or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2. The A2g horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2.

The B horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2; or it has hue of 10YR, value of 5, and chroma of 1. Texture is silt loam or silty clay loam. Mottles in shades of brown and gray are common to many.

The C horizon has the same color and texture range as the B horizon.

Calhoun series

The Calhoun series consists of deep, poorly drained, slowly permeable, level soils that formed in loamy material. These soils are on broad flats and in depressions on loess plains. The native vegetation under which these soils formed was mainly mixed hardwood forest. Slopes are 0 to 1 percent.

Calhoun soils are geographically associated with Calloway, Crowley, Loring, and Tichnor soils. Calloway soils, on broad flats and terraces at slightly higher elevations, have a fragipan and are somewhat poorly drained. Crowley soils, on broad flats and terraces, have a fine control section. Loring soils, on uplands at higher elevations, are moderately well drained and have a fragipan. Tichnor soils, on flood plains, do not have glossic properties and have a thicker A horizon.

Typical pedon of Calhoun silt loam, 0 to 1 percent slopes, in a field in the NW1/4NE1/4NW1/4 sec. 27, T. 1 N., R. 6 W., Prairie County:

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam; few fine faint grayish brown mottles; weak medium granular structure; friable; common fine roots; common brown stains; few fine dark concretions; medium acid; abrupt smooth boundary.

A21g—5 to 10 inches; grayish brown (10YR 5/2) silt loam; common fine distinct yellowish brown mottles; weak medium subangular blocky structure; friable; common fine roots; common brown stains; few fine dark concretions; strongly acid; clear smooth boundary.

A22g—10 to 18 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct yellowish brown (10YR 5/4, 5/6) mottles; weak medium subangular blocky structure; friable; few fine roots; few brown stains; few fine dark concretions; very strongly acid; clear irregular boundary.

B21tg—18 to 29 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct yellowish brown (10YR 5/4, 5/6) and faint light brownish gray (10YR 6/2) mottles; surfaces of peds have patchy coatings of dark grayish brown; weak coarse prismatic parting to moderate medium subangular blocky structure; firm; tongues of light gray silt from the A2g horizon 1/2 inch to 2 inches wide extend through the horizon; common thin patchy distinct clay films on faces of peds; few fine dark concretions; very strongly acid; clear wavy boundary.

B22tg—29 to 41 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct yellowish brown (10YR 5/4, 5/6) mottles; weak coarse prismatic parting to moderate medium subangular blocky structure; firm; tongues of light gray silt from the A2g horizon extend to the lower boundary of the horizon; common patchy distinct clay films on faces of peds; common brown stains; few fine dark concretions; very strongly acid; clear wavy boundary.

B23tg—41 to 52 inches; light brownish gray (10YR 6/2) silty clay loam; common medium distinct yellowish brown (10YR 5/4, 5/6) mottles; weak medium subangular blocky structure; firm; few patchy thin clay films on faces of peds; few streaks and pockets of light gray silt; few fine dark concretions; few brown stains; strongly acid; gradual wavy boundary.

B3g—52 to 72 inches; gray (10YR 6/1) silty clay loam; common medium distinct yellowish brown (10YR

5/6) and light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; firm; few pockets or streaks of light gray silt; few brown stains; few fine dark concretions; strongly acid.

The solum thickness ranges from 40 to 72 inches or more. Reaction ranges from very strongly acid to medium acid in the A horizon. Reaction is very strongly acid or strongly acid in the upper part of the B horizon and ranges from very strongly acid to neutral in the lower part of the B horizon and underlying material.

The combined thickness of the A horizon ranges from 12 to 24 inches. The Ap horizon has hue of 10YR, value of 4, and chroma of 2 or 3; or it has hue of 10YR, value of 5, and chroma of 1 or 2. The A2 horizon has hue of 10YR, value of 5, 6, or 7, and chroma of 1 or 2.

The B 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 5 or 6, and chroma of 2. Few to common mottles in shades of gray, brown, and yellow are present. Texture is silt loam or silty clay loam.

The C horizon, where present, has hue of 10YR, value of 5, and chroma of 1, 2, 3, or 4; hue of 10YR, value of 6, and chroma of 1 or 2; or hue of 2.5Y, value of 6, and chroma of 2. Texture and mottles are the same as in the B horizon.

Calloway series

The Calloway series consists of deep, somewhat poorly drained, slowly permeable, level soils that formed in thick silty loess deposits on loess plains and terraces. The native vegetation under which these soils formed was mixed hardwood forest. Slopes are 0 to 1 percent.

Calloway soils are geographically associated with Calhoun, Loring, and Tichnor soils. Calhoun soils, in depressions and on broad flats at slightly lower elevations, do not have a fragipan and are poorly drained. Loring soils, on uplands and at slightly higher elevations, are moderately well drained. Tichnor soils, on flood plains, are poorly drained and do not have a fragipan.

Typical pedon of Calloway silt loam, 0 to 1 percent slopes, in a field in the NE1/4NE1/4NE1/4 sec. 7, T. 2 N., R. 7 W., Lonoke County:

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam; common fine distinct grayish brown and brown mottles; weak medium granular structure; very friable; common fine roots; few fine pores; few fine dark concretions; medium acid; abrupt smooth boundary.

A2—5 to 10 inches; grayish brown (10YR 5/2) silt loam; common fine distinct brown and yellowish brown mottles; weak medium subangular blocky structure; friable; common fine roots; common fine pores; common fine dark concretions; common brown stains; strongly acid; clear smooth boundary.

B2—10 to 21 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct strong brown (7.5YR 5/6) and grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; friable; common fine roots; common fine pores; common fine dark concretions; common brown stains; very strongly acid; clear smooth boundary.

A'2—21 to 26 inches; light brownish gray (10YR 6/2) silt loam; common fine faint pale brown and distinct yellowish brown mottles; weak medium subangular blocky structure; very friable; common fine pores; common fine and medium dark concretions; common brown stains; very strongly acid; clear wavy boundary.

B'x—26 to 60 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct gray (10YR 6/1) and yellowish brown (10YR 5/4 and 5/6) mottles; moderate coarse prismatic structure parting to moderate medium subangular blocky; firm and brittle; common patchy distinct clay films on faces of peds and in pores; common fine pores; common fine and medium dark concretions; thick grayish silt coatings on faces of prisms and thin coatings on faces of peds; common black and brown stains; strongly acid; gradual wavy boundary.

B3—60 to 72 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct gray (10YR 5/1) and strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; firm; few fine pores; common fine and medium dark concretions; common brown stains; strongly acid.

The solum thickness ranges from 62 to 72 inches or more. Reaction ranges from very strongly acid to medium acid in the A horizon and upper part of the B horizon and from strongly acid to neutral in the lower part of the B horizon. Depth to the fragipan ranges from 16 to 32 inches.

The combined thickness of the A horizon ranges from 4 to 10 inches. The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. The A2 horizon, where present, has hue of 10YR, value of 5, and chroma of 2 or 3; or it has hue of 10YR, value of 6, and chroma of 3.

The B2 horizon has hue of 10YR, value of 5, and chroma of 4 or 6; or it has hue of 10YR, value of 6, and chroma of 4. Few to common mottles in shades of gray and brown are present. Texture is silt loam or silty clay loam.

The A'2 horizon has hue of 10YR, value of 5, 6, or 7, and chroma of 2; or it has hue of 10YR, value of 6, and chroma of 3.

The B'x horizon has hue of 10YR, value of 5, and chroma of 2, 4, or 6; or it is mottled brown, gray, and yellow. Texture is silt loam or silty clay loam.

The B3 horizon, where present, has the same color and texture range as the B'x horizon.

Caspiana series

The Caspiana series consists of deep, well drained, moderately permeable, level soils that formed in loamy alluvium on bottom lands of the Arkansas River. These soils are on natural levees bordering abandoned stream channels of the Arkansas River. The native vegetation under which these soils formed was mixed hardwood forest. Slopes are 0 to 1 percent.

Caspiana soils are geographically associated with Hebert, Keo, and Rilla soils. Hebert soils, on the lower parts of natural levees, are somewhat poorly drained and do not have a mollic epipedon. Keo soils, on similar landscapes, do not have an argillic horizon or a mollic epipedon. Rilla soils, on similar landscapes, do not have a mollic epipedon.

Typical pedon of Caspiana silt loam, 0 to 1 percent slopes, in a field, in the SW1/4NE1/4NW1/4 sec. 21, T. 1 S., R. 9 W., Lonoke County:

Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) silt loam; weak fine granular structure; very friable; common fine roots; medium acid; abrupt smooth boundary.

B1—6 to 11 inches; very dark brown (10YR 2/2) silt loam with brown (7.5YR 4/4) ped coatings; weak medium subangular blocky structure; friable; few fine roots; common fine pores; slightly acid; clear wavy boundary.

B21t—11 to 16 inches; very dark grayish brown (10YR 3/2) and brown (7.5YR 4/4) silt loam with a few very dark brown (10YR 2/2) ped coatings and streaks; weak coarse subangular blocky structure parting to moderate medium subangular blocky; friable; thin patchy clay films on faces of peds; few fine roots; common fine pores; slightly acid; clear wavy boundary.

B22t—16 to 27 inches; brown (7.5YR 4/4) silt loam with dark brown (10YR 3/3) ped coatings and streaks; weak coarse subangular blocky structure parting to moderate medium subangular blocky; friable; thin patchy clay films on faces of peds; common fine pores; slightly acid; gradual wavy boundary.

B3—27 to 36 inches; brown (7.5YR 4/4) silt loam with dark brown (10YR 3/3) ped coatings and streaks; weak coarse subangular blocky structure parting to weak medium subangular blocky; friable; many fine pores; neutral; gradual wavy boundary.

C1—36 to 49 inches; brown (7.5YR 5/4) very fine sandy loam; few fine faint strong brown mottles; massive; very friable; neutral; clear smooth boundary.

C2—49 to 68 inches; reddish brown (5YR 4/4) silty clay loam; common fine distinct grayish brown (10YR 5/2) and strong brown (7.5YR 5/6) mottles; massive; firm; few carbonate concretions; mildly alkaline; clear wavy boundary.

C3—68 to 72 inches; reddish brown (5YR 4/4) very fine sandy loam; massive; very friable; mildly alkaline.

The solum thickness ranges from 30 to 60 inches. Reaction ranges from medium acid to neutral in the A horizon, from medium acid to mildly alkaline in the B horizon, and from slightly acid to moderately alkaline in the C horizon.

The A horizon ranges from 4 to 15 inches in thickness. It has hue of 10YR, value of 3, and chroma of 1 or 2; or hue of 10YR, value of 2, and chroma of 2; or hue of 7.5YR, value of 3, and chroma of 2.

The upper part of the B horizon, to a depth of 12 to 20 inches, has the same color range as the A horizon. Below the mollic epipedon, the B horizon has hue of 5YR, value of 4, and chroma of 3, 4, or 6; or hue of 5YR, value of 5, and chroma of 6; or hue of 7.5YR, value of 4 or 5, and chroma of 4. Texture is silt loam or silty clay loam.

The C horizon has the same color range as the B horizon. Texture is very fine sandy loam, loam, silt loam, or silty clay loam.

Commerce series

The Commerce series consists of deep, somewhat poorly drained, moderately slowly permeable soils that formed in loamy alluvium. These soils are on alluvial plains of the White River. They have a high water table late in winter and in early spring. The native vegetation under which these soils formed was mixed hardwood forest. Slopes are 0 to 3 percent.

Commerce soils are geographically associated with Dubbs, Jackport, and Kobel soils. Dubbs soils, on natural levees at higher elevations, are well drained. Kobel soils, on broad flats at lower elevations, are poorly drained and have a fine control section. Jackport soils, on terraces at higher elevations, are poorly drained and have a very-fine control section.

Typical pedon of Commerce silt loam, frequently flooded, in a field in the SE1/4NW1/4SE1/4 sec. 14, R. 4 W., T. 2 N., Prairie County:

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam; weak medium granular structure; friable; common fine roots; few fine pores; slightly acid; abrupt smooth boundary.

B2—5 to 26 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct strong brown (7.5YR 5/6) and dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; firm; few fine roots; few fine pores; few fine dark concretions; neutral; clear wavy boundary.

B3—26 to 34 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct strong brown (7.5YR 5/6) and gray (10YR 5/1) mottles; weak fine subangular blocky structure; firm; few fine pores; few brown stains; few dark concretions; neutral; clear wavy boundary.

C1—34 to 48 inches; grayish brown (10YR 5/2) silt loam; common medium distinct strong brown (7.5YR

5/6), gray (10YR 5/1), and brown (10YR 4/3) mottles; massive; friable; few fine dark concretions; neutral; clear smooth boundary.

C2—48 to 58 inches; grayish brown (10YR 5/2) and gray (10YR 5/1) silty clay loam; common medium distinct strong brown (7.5YR 5/6) and brown (7.5YR 5/4) mottles; massive; firm; few fine dark concretions; common black stains; mildly alkaline; clear smooth boundary.

C3—58 to 66 inches; grayish brown (10YR 5/2) and gray (10YR 5/1) loam; common medium distinct strong brown (7.5YR 5/6) and brown (7.5YR 5/4) mottles; massive; friable; common black stains; mildly alkaline; clear smooth boundary.

C4—66 to 72 inches; grayish brown (10YR 5/2) and gray (10YR 5/1) silty clay loam; common medium distinct strong brown (7.5YR 5/6) and brown (7.5YR 5/4) mottles; massive; firm; few fine dark concretions; common black stains; mildly alkaline.

The solum thickness ranges from about 20 to 40 inches. Reaction ranges from medium acid to neutral in the A horizon, from slightly acid to mildly alkaline in the B horizon, and from neutral to moderately alkaline in the C horizon.

The thickness of the A horizon ranges from 4 to 6 inches. The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3.

The B2 horizon has hue of 10YR, value of 4 or 5, and chroma of 2. The B3 horizon has hue of 10YR, value of 5, and chroma of 1 or 2. Texture of the B horizon is silt loam or silty clay loam. The B horizon has few to common mottles in shades of brown or gray.

The C horizon has colors similar to those of the B3 horizon. Texture is very fine sandy loam, loam, silt loam, or silty clay loam and is commonly stratified.

Crowley series

The Crowley series consists of deep, somewhat poorly drained, very slowly permeable, level soils that formed in loamy material underlain by clayey alluvium. These soils are on broad flats and terraces on the Loess Plains. The native vegetation under which these soils formed was mainly tall prairie grasses, but some areas were in mixed hardwood forest. Slopes are 0 to 1 percent.

Crowley soils are geographically associated with Calhoun, Muskogee, and Stuttgart soils. Calhoun soils, on broad flats and in depressions at slightly lower elevations, have a fine-silty control section. Muskogee soils, on gently sloping uplands, are moderately well drained and have a fine-silty control section. Stuttgart soils, on similar landscapes at slightly higher elevations, are moderately well drained.

Typical pedon of Crowley silt loam, 0 to 1 percent slopes, in a field in the SE1/4SE1/4NE1/4 sec. 5, T. 1 N., R. 6 W., Prairie County:

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam; common fine distinct brown and grayish brown mottles; weak medium granular structure; friable; common fine roots; common fine pores; few brown stains; few fine black concretions; medium acid; abrupt smooth boundary.

A21g—5 to 14 inches; grayish brown (10YR 5/2) silt loam; common medium distinct yellowish brown (10YR 5/4 and 5/6) mottles; weak medium subangular blocky structure; friable; few fine roots; common fine pores; few brown stains; few fine black concretions; medium acid; clear smooth boundary.

A22g—14 to 22 inches; gray (10YR 6/1) silt loam; common medium faint light brownish gray (10YR 6/2) and distinct yellowish brown (10YR 5/4 and 5/6) mottles; weak medium subangular blocky structure; friable; few fine roots; few fine pores; few fine black concretions; strongly acid; abrupt smooth boundary.

B21tg—22 to 36 inches; grayish brown (10YR 5/2) silty clay; many fine prominent red mottles; moderate medium subangular blocky structure; firm; thick continuous clay films; few fine pores; few fine black concretions; few thin streaks and coatings of gray silt; very strongly acid; clear wavy boundary.

B22tg—36 to 53 inches; gray (10YR 6/1) silty clay; common medium faint light brownish gray (10YR 6/2) and distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; thick patchy clay films; few fine pores; few fine black concretions; very strongly acid; gradual wavy boundary.

B3g—53 to 72 inches; light brownish gray (10YR 6/2) silty clay; common medium faint gray (10YR 6/1) and distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; firm; common fine and medium black concretions; common black stains; medium acid.

The solum thickness ranges from about 48 to 72 inches or more. Reaction ranges from very strongly acid to medium acid in the A horizon, from very strongly acid to slightly acid in the B2t horizon, and from medium acid to mildly alkaline in the B3 horizon. Depth to the abrupt textural change ranges from about 18 to 25 inches.

The combined thickness of the A horizon ranges from 18 to 25 inches. The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. The A2g horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. Mottles in shades of gray and brown range from few to common in the A2g horizon.

The B2tg horizon has hue of 10YR, value of 5 or 6, and chroma of 1; or it has hue of 10YR, value of 5, and chroma of 2. Common to many fine prominent mottles in shades of red are present. Texture is silty clay or silty clay loam.

The B3g horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. Common mottles in shades of brown and gray are present. Texture is silty clay loam or silty clay.

Dubbs series

The Dubbs series consists of deep, well drained, moderately permeable soils that formed in loamy alluvium on bottom lands of the White River. These soils are on natural levees bordering abandoned stream channels of the White River and its tributaries. The native vegetation under which these soils formed was mixed hardwood forest. Slopes are 0 to 3 percent.

Dubbs soils are geographically associated with Commerce and Kobel soils. Commerce and Kobel soils are on broad flats and flood plains. Commerce soils are somewhat poorly drained. Kobel soils are poorly drained and have a very-fine control section.

Typical pedon of Dubbs silt loam, 0 to 1 percent slopes, in a field in the NW1/4NE1/4NE1/4 sec. 2, T. 2 N., R. 4 W., Prairie County:

Ap—0 to 6 inches; dark brown (10YR 4/3) silt loam; weak medium granular structure; friable; common fine roots, common fine pores; medium acid; abrupt smooth boundary.

B1—6 to 12 inches; brown (7.5YR 4/4) silt loam; weak medium subangular blocky structure; friable; common fine roots; common fine pores; strongly acid; clear smooth boundary.

B21t—12 to 24 inches; brown (7.5YR 4/4) silt loam; moderate medium subangular blocky structure; friable; thin patchy clay films on peds and in pores; few fine roots; few fine pores; few black stains; strongly acid; gradual wavy boundary.

B22t—24 to 38 inches; brown (7.5YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; thick patchy clay films on peds and in pores; few fine roots; few fine pores; common black stains and coatings; strongly acid; clear wavy boundary.

B3—38 to 52 inches; brown (7.5YR 4/4) loam; weak medium subangular blocky structure; friable; few thin patchy clay films; few fine pores; few black stains; strongly acid; gradual wavy boundary.

IIC—52 to 72 inches; brown (7.5YR 4/4) loamy fine sand; massive; very friable; strongly acid.

The solum thickness ranges from 40 to about 55 inches. Reaction ranges from strongly acid to medium acid in the A horizon and from very strongly acid to medium acid in the B and C horizons.

The A horizon ranges from 4 to 8 inches in thickness. The A horizon has hue of 10YR, value of 4 or 5, and chroma of 3.

The B horizon has hue of 7.5YR, value of 4 or 5, and chroma or 4. Texture of the B2t horizon is silt loam, clay loam, or silty clay loam. Texture of the B3 horizon is loam, silt loam, or very fine sandy loam.

The C horizon has hue of 7.5YR, value of 4 or 5, and chroma of 4, or it has hue of 7.5YR, value of 5, and chroma of 6. Texture ranges from fine sandy loam to loamy sand.

Enders series

The Enders series consists of deep, well drained, very slowly permeable soils that formed in a thin layer of colluvial material and clayey residuum of shale or interbedded shale and sandstone. These soils are on side slopes and crests of uplands in the Arkansas Valley area. The native vegetation under which these soils formed was mixed hardwood forest. Slopes range from 8 to 25 percent.

Enders soils are geographically associated with Leadvale, Linker, and Mountainburg soils. Leadvale soils, on toe slopes, have a fragipan and a fine-silty control section. Linker soils, on similar landscapes, have a fine-loamy control section. Mountainburg soils, on similar landscapes, have a loamy-skeletal control section and are shallower to bedrock.

Typical pedon of Enders stony fine sandy loam, 8 to 15 percent slopes, in a wooded area in the NE1/4SE1/4NE1/4 sec. 33, T. 5 N., R. 10 W., Lonoke County:

O1—1 inch to 0; litter of leaves and twigs.

A1—0 to 3 inches; very dark grayish brown (10YR 3/2) stony fine sandy loam; weak medium granular structure; very friable; about 20 percent sandstone fragments 3 to 15 inches or more in diameter; common fine roots; strongly acid; clear wavy boundary.

B1—3 to 8 inches; strong brown (7.5YR 5/6) stony loam; weak medium subangular blocky structure; friable; 15 percent sandstone fragments 3 to 12 inches or more in diameter; common fine roots; very strongly acid; clear wavy boundary.

B21t—8 to 20 inches; yellowish red (5YR 5/6) silty clay; moderate fine to medium subangular blocky structure; firm; 10 percent sandstone and shale fragments 1/2 inch to 6 inches in diameter; common patchy distinct clay films on faces of peds; few fine roots; very strongly acid; gradual wavy boundary.

B22t—20 to 34 inches; yellowish red (5YR 5/6) clay; common fine distinct red, strong brown, and pale brown mottles; strong fine to medium subangular blocky structure; very firm; 10 percent shale fragments 1/2 inch to 2 inches in diameter; many patchy distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

B23t—34 to 42 inches; mottled red (2.5YR 4/8), yellowish red (5YR 5/6), gray (10YR 6/1), and strong brown (7.5YR 5/6) silty clay; moderate fine to medium subangular blocky structure; firm; 10 percent shale fragments 1/2 inch to 2 inches in diameter; many patchy distinct clay films on faces of peds; very strongly acid; gradual wavy boundary.

B3—42 to 52 inches; mottled red (2.5YR 4/8), gray (10YR 6/1), and strong brown (7.5YR 5/6) shaly silty clay; moderate fine subangular blocky structure; firm; 25 percent shale fragments 1/2 to 3 inches in diameter; very strongly acid; diffuse boundary.

Cr—52 to 72 inches; mottled red (2.5YR 4/8), gray (10YR 6/1), strong brown (7.5YR 5/6), weathered laminar shale; massive to weak platy structure; fragments of shale easily crushed; very strongly acid.

The solum thickness ranges from 32 to about 59 inches. Depth to bedrock ranges from about 40 to more than 62 inches. Reaction in all horizons is strongly acid or very strongly acid. Fragments of shale or sandstone make up, by volume, 15 to 30 percent of the A and B1 horizons, 0 to 15 percent of the B2t horizon, and 5 to 50 percent of the B3 horizon.

The A1 horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. The Ap horizon, where present, has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. The A12 horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4; or it has hue of 10YR, value of 5, and chroma of 6.

The B1 horizon, where present, has hue of 7.5YR, value of 5, and chroma of 4, 6, or 8. Texture is stony loam or stony silt loam. The B2t horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8. The lower part of the B2t horizon is commonly mottled in shades of brown, red, or gray. Texture of the B2t horizon is silty clay loam, silty clay, or clay. The B3 horizon has mottled patterns of red, brown, and gray. Texture of the B3 horizon is silty clay or clay.

Hebert series

The Hebert series consists of deep, somewhat poorly drained, moderately slowly permeable, level soils that formed in loamy alluvium on bottom lands of the Arkansas River. These soils are on the lower parts of natural levees bordering abandoned stream channels of the Arkansas River. The native vegetation under which these soils formed was mixed hardwood forest. Slopes are 0 to 1 percent.

Hebert soils are geographically associated with Caspiana, Keo, Perry, Portland, and Rilla soils. Caspiana, Keo, and Rilla soils are on the higher parts of natural levees. Caspiana soils have a mollic epipedon and are well drained. Keo soils do not have an argillic horizon and are well drained. Rilla soils are well drained. Perry and Portland soils, on slackwater areas, have very-fine control sections. In addition, Perry soils are poorly drained.

Typical pedon of Hebert silt loam, 0 to 1 percent slopes, in a field in the SW1/4SE1/4NW1/4 sec. 5, T. 2 S., R. 9 W., Lonoke County:

Ap—0 to 7 inches; brown (10YR 4/3) silt loam; weak medium granular structure; friable; common fine and medium roots; few fine pores; strongly acid; clear smooth boundary.

A2—7 to 14 inches; grayish brown (10YR 5/2) silt loam; common medium distinct brown (10YR 4/3) and strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; few fine roots; common fine pores; few fine dark concretions; strongly acid; clear wavy boundary.

B21t—14 to 27 inches; reddish brown (5YR 4/4) silty clay loam; grayish brown (10YR 5/2) and light brownish gray (10YR 6/2) silt coatings on peds; common medium distinct yellowish red (5YR 5/6) and reddish gray (5YR 5/2) mottles; moderate coarse prismatic parting to moderate medium subangular blocky structure; firm; thin patchy clay films on faces of peds and in pores; few fine roots; common fine pores; few fine dark concretions; very strongly acid; gradual wavy boundary.

B22t—27 to 36 inches; reddish brown (5YR 5/4) silt loam; grayish brown (10YR 5/2) and light brownish gray (10YR 6/2) silt coatings on peds; common fine distinct yellowish red and reddish gray mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; thin patchy clay films on faces of peds and in pores; common fine pores; few fine soft dark brown concretions; very strongly acid; gradual wavy boundary.

B3—36 to 53 inches; brown (7.5YR 4/4) silt loam; common fine distinct grayish brown and strong brown mottles; weak medium subangular blocky structure; friable; few fine pores; few fine soft dark brown concretions; strongly acid; gradual wavy boundary.

C—53 to 72 inches; reddish brown (5YR 5/4) silt loam; few fine distinct grayish brown and strong brown mottles; massive; friable; few black stains; few fine soft dark brown concretions; slightly acid.

The solum thickness ranges from 36 to 72 inches. Reaction ranges from strongly acid to slightly acid in the A horizon, from very strongly acid to slightly acid in the B horizon, and from strongly acid to mildly alkaline in the C horizon.

The combined thickness of the A horizon ranges from 8 to 16 inches. The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. The A2 horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2.

The B horizon has hue of 5YR, value of 4 or 5, and chroma of 3 or 4; or it has hue of 7.5YR, value of 4 or 5, and chroma of 4. Mottles in shades of brown, red, and gray range from few to common. Subhorizons of the B horizon in some pedons may have hue of 10YR, value of 4, 5, or 6, and chroma of 2. Silt coatings on peds have hue of 10YR, value of 5 or 6, and chroma of 1 or 2. Texture of the B horizon is loam, silt loam, or silty clay loam.

The C horizon has the same color range as the B horizon. Texture of the C horizon is very fine sandy loam, silt loam, or silty clay loam.

Jackport series

The Jackport series consists of deep, poorly drained, very slowly permeable, level to nearly level soils that formed in clayey alluvium. These soils are on terraces that were backswamps of former streams. The native vegetation under which these soils formed was mixed hardwood forest. Slopes are 0 to 3 percent.

Jackport soils are geographically associated with Kobel and Commerce soils. Kobel and Commerce soils are on flood plains at lower elevations. Kobel soils are nonacid. Commerce soils are somewhat poorly drained and have a fine-silty control section.

Typical pedon of Jackport silty clay loam, 0 to 1 percent slopes, in a field in the NE1/4NE1/4NE1/4 sec. 25, T. 5 N., R. 5 W., Prairie County:

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) silty clay loam; moderate fine subangular blocky structure; firm; common fine roots; few fine dark concretions; strongly acid; abrupt smooth boundary.

B21tg—4 to 10 inches; grayish brown (2.5Y 5/2) silty clay; common fine distinct strong brown mottles; moderate fine subangular blocky structure; firm; common fine roots; few fine dark concretions; very strongly acid; clear smooth boundary.

B22tg—10 to 36 inches; grayish brown (2.5Y 5/2) clay; common fine distinct strong brown mottles; moderate medium angular blocky structure; very firm; few fine roots; shiny faces on peds; few slickensides which do not intersect; few fine dark concretions; very strongly acid; clear smooth boundary.

B23tg—36 to 46 inches; grayish brown (2.5Y 5/2) silty clay; common medium distinct yellowish brown (10YR 5/4) and strong brown (7.5YR 5/6) mottles; moderate medium angular blocky structure; very firm; shiny faces on peds; few slickensides which do not intersect; few fine dark concretions; very strongly acid; clear wavy boundary.

B3g—46 to 55 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium distinct yellowish brown (10YR 5/4) and strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; shiny faces on peds; few fine dark concretions; common black stains; few fine white crystals; medium acid; gradual wavy boundary.

Cg—55 to 72 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6, 5/4) and brown (7.5YR 5/4) mottles; weak medium subangular blocky structure; firm; common fine dark concretions; common black stains; few fine white crystals; mildly alkaline.

The solum thickness ranges from 36 to 60 inches. Reaction ranges from very strongly acid to medium acid in the A horizon. In the B horizon, reaction is very strongly acid or strongly acid in the upper part and ranges from very strongly acid to mildly alkaline in the lower part. Reaction ranges from slightly acid to moderately alkaline in the C horizon.

The A horizon ranges from about 3 to 10 inches in thickness. The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2.

The B horizon has hue of 10YR, 5Y, or 2.5Y; value of 5; and chroma of 2. The B21t and B23t horizons are silty clay or clay, and the B3 horizon is silty clay loam or silty clay. The B horizon has few to common mottles in shades of brown or yellow.

The C horizon has the same colors as the B horizon. Texture is silty clay, silty clay loam, or silt loam.

Keo series

The Keo series consists of deep, well drained, moderately permeable, level to nearly level soils that formed in loamy alluvium on the Arkansas River bottom lands. These soils are on natural levees bordering abandoned stream channels of the Arkansas River. The native vegetation under which these soils formed was mixed hardwood forest. Slopes are 0 to 3 percent.

Keo soils are geographically associated with Caspiana and Hebert soils. Caspiana soils, on similar landscapes, have an argillic horizon and a mollic epipedon. Hebert soils, on the lower parts of natural levees, are somewhat poorly drained and have an argillic horizon.

Typical pedon of Keo silt loam, 0 to 1 percent slopes, in a field in the NE1/4NE1/4SW1/4 sec. 21, T. 1 N., R. 10 W., Lonoke County:

Ap—0 to 6 inches; dark brown (7.5YR 4/4) silt loam; weak fine granular structure; very friable; common fine roots; slightly acid; abrupt smooth boundary.

B1—6 to 12 inches; dark brown (7.5YR 4/4) silt loam; weak medium subangular blocky structure; very friable; few fine roots; slightly acid; clear smooth boundary.

B2—12 to 30 inches; dark brown (7.5YR 4/4) silt loam; weak medium subangular blocky structure; friable; common fine pores; neutral; clear wavy boundary.

C1—30 to 48 inches; brown (7.5YR 5/4) very fine sandy loam; massive; very friable; neutral; clear smooth boundary.

IIAb—48 to 54 inches; dark brown (7.5YR 4/4) silt loam; few fine distinct strong brown mottles; weak medium subangular blocky structure; friable; few fine pores; few dark stains; few small concretions; mildly alkaline; clear smooth boundary.

IIIC2—54 to 72 inches; brown (7.5YR 5/4) very fine sandy loam; massive; very friable; mildly alkaline.

The solum thickness ranges from 28 to about 50 inches. Reaction ranges from slightly acid to mildly alkaline in the A and B horizons. The materials underlying the B horizon are neutral to moderately alkaline.

The A horizon ranges from 6 to 12 inches in thickness. It has hue of 7.5YR, value of 4 or 5, and chroma of 2 or 4; or it has hue of 10YR, value of 4, and chroma of 3 or 4.

The B horizon has hue of 7.5YR, value of 4 or 5, and chroma of 2 or 4. Texture is very fine sandy loam or silt loam.

The materials underlying the B horizon have hue of 7.5YR, value or 4 or 5, and chroma of 4. Texture is fine sandy loam, very fine sandy loam, silt loam, or silty clay loam.

Kobel series

The Kobel series consists of deep, poorly drained, very slowly permeable soils that formed in clayey alluvium on White River bottom land areas. These soils are on broad flats and in depressions that were backswamps of the White River and its tributaries. They have a perched water table late in winter and early in spring. The native vegetation under which these soils formed was mixed hardwood forest. Slopes are 0 to 3 percent.

Kobel soils are geographically associated with Commerce, Jackport, and Dubbs soils. Commerce soils, on similar landscapes at slightly higher elevations, have a fine-silty control section and are somewhat poorly drained. Dubbs soils, on natural levees at higher elevations, have a fine-silty control section and are well drained. Jackport soils, on terraces at higher elevations, are acid.

Typical pedon of Kobel silty clay loam, 0 to 1 percent slopes, in a field in the SE1/4NE1/4NE1/4 sec. 10, T. 4 N., R. 4 W., Prairie County:

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) and very dark grayish brown (10YR 3/2) silty clay loam; weak fine subangular blocky structure; firm; common fine roots; slightly acid; clear smooth boundary.

B21g—4 to 20 inches; dark gray (10YR 4/1) silty clay; common medium prominent strong brown (7.5YR 5/6) mottles; moderate fine subangular blocky structure; very firm; few fine roots; shiny faces on peds; few slickensides which do not intersect; common fine dark concretions; neutral; clear smooth boundary.

B22g—20 to 36 inches; gray (10YR 5/1) silty clay; common medium distinct yellowish brown (10YR 5/4) and strong brown (7.5YR 5/6) and few medium faint dark gray mottles; moderate fine subangular blocky structure; very firm; few fine roots; shiny faces on peds; common fine dark concretions; mildly alkaline; gradual wavy boundary.

B3g—36 to 56 inches; gray (10YR 5/1) silty clay; common medium distinct yellowish brown (10YR 5/4) and strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; very firm; shiny faces on peds; common fine dark concretions; few black stains; moderately alkaline; gradual wavy boundary.

Cg—56 to 72 inches; gray (10YR 5/1) silty clay; common medium distinct yellowish brown (10YR 5/4 and 5/6) and strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; firm; common fine and medium dark concretions; common black stains; moderately alkaline.

The solum thickness ranges from about 36 to 60 inches. Reaction ranges from medium acid to neutral in the A horizon, from slightly acid to moderately alkaline in the B horizon, and from neutral to moderately alkaline in the C horizon.

The A horizon ranges from 4 to 8 inches in thickness. The A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2.

The B horizon has hue of 10YR, value of 4, 5, or 6, and chroma of 1. Mottles in shades of brown and yellow range from few to common. Texture is silty clay loam, silty clay, or clay.

The C horizon is similar in color to the B horizon. Texture is silty clay loam, silty clay, or clay. In some pedons, texture below a depth of 40 inches is fine sandy loam or silt loam.

Leadvale series

The Leadvale series consists of deep, moderately well drained, slowly permeable, nearly level to gently sloping soils that formed in loamy materials. These soils are on toe slopes of ridges, benches, and terraces in the Arkansas Valley area. The native vegetation under which these soils formed was mixed hardwood forest. Slopes range from 1 to 8 percent.

Leadvale soils are geographically associated with Amy, Enders, Sawyer, Sacul, Smithdale, and Taft soils. Amy soils, on flood plains, are poorly drained and do not have a fragipan. Enders soils, on side slopes, have a clayey control section and do not have a fragipan. Sawyer soils, on side slopes, do not have a fragipan. Sacul soils, also on side slopes, have a clayey control section and do not have a fragipan. Smithdale soils, on uplands slightly higher in elevation, do not have a fragipan. Taft soils, on terraces at slightly lower elevations, are somewhat poorly drained.

Typical pedon of Leadvale silt loam, 3 to 8 percent slopes, in a field in the SW1/4SW1/4NW1/4 sec. 16, T. 5 N., R. 10 W., Lonoke County:

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

B1—6 to 11 inches; strong brown (7.5YR 5/6) silt loam; weak medium subangular blocky structure; friable; common fine roots; few fine pores; strongly acid; clear wavy boundary.

B21t—11 to 20 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm; patchy distinct clay films on faces of peds; few fine roots; few fine pores; very strongly acid; clear wavy boundary.

B22t—20 to 28 inches; yellowish brown (10YR 5/6) silty clay loam; common fine distinct grayish brown and strong brown mottles in the lower few inches; moderate medium subangular blocky structure; firm; patchy distinct clay films on faces of peds; few fine pores; few fine dark concretions; very strongly acid; clear smooth boundary.

Bx1—28 to 48 inches; yellowish brown (10YR 5/6) silty clay loam; common medium distinct light brownish gray (10YR 6/2) and strong brown (7.5YR 5/6) mottles; weak coarse prismatic parting to moderate medium and coarse subangular blocky structure; firm, brittle; patchy distinct clay films on faces of peds; narrow seams of gray (10YR 6/1) silt loam between prisms; common fine pores; few fine dark brown and black concretions; very strongly acid; gradual wavy boundary.

Bx2—48 to 72 inches; mottled yellowish brown (10YR 5/4, 5/6), light brownish gray (10YR 6/2), and strong brown (7.5YR 5/6) silt loam; weak coarse prismatic parting to moderate medium subangular blocky structure; firm, brittle; patchy distinct clay films on faces of peds; narrow seams of gray (10YR 6/1) silty clay loam between prisms; common fine pores; few fine dark brown and black concretions; very strongly acid.

The solum thickness ranges from about 50 to more than 72 inches. The depth to the fragipan ranges from about 18 to 36 inches. Reaction in this soil is strongly acid or very strongly acid throughout except where limed.

The A horizon ranges from 4 to 8 inches in thickness. The Ap horizon has hue of 10YR, value of 4, and chroma of 2 or 3; or it has hue of 10YR, value of 5, and chroma of 3.

The B1 and B2t horizons have hue of 10YR or 7.5YR, value of 5, and chroma of 6 or 8. Texture is silt loam, loam, or silty clay loam.

The Bx horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 6 or 8; or some pedons lack a matrix color and are mottled in shades of brown, yellow, and gray. Texture is silt loam or silty clay loam.

The B3 and C horizons, where present, have the same color range as the Bx horizon. Texture is silty clay loam or silty clay.

Linker series

The Linker series consists of moderately deep, moderately permeable, moderately steep to steep, well drained soils that formed in loamy residuum of sandstone or interbedded sandstone and shale. These soils formed on ridgetops and side slopes. The native vegetation under which these soils formed was mixed hardwood forest. Slopes range from 12 to 25 percent.

Linker soils are geographically associated with Enders and Mountainburg soils. Enders soils, on similar landscapes, have a clayey control section. Mountainburg soils, also on similar landscapes, have a loamy-skeletal control section and are less than 20 inches deep to bedrock.

Typical pedon of Linker stony fine sandy loam from an area of Linker-Enders-Mountainburg complex, 12 to 25 percent slopes, in a wooded area in the SW1/4SW1/4NE1/4 sec. 22, T. 4 N., R. 10 W., Lonoke County:

A1—0 to 4 inches; dark brown (10YR 4/3) stony fine sandy loam; weak medium granular structure; very friable; about 20 percent sandstone fragments 3 to 18 inches or more in diameter; common fine roots; strongly acid; clear wavy boundary.

B1—4 to 12 inches; strong brown (7.5YR 5/6) fine sandy loam; weak medium subangular blocky structure; very friable; about 10 percent by volume sandstone fragments 3 to 10 inches in diameter; few fine roots; very strongly acid; clear wavy boundary.

B2t—12 to 28 inches; yellowish red (5YR 5/6) sandy clay loam; moderate medium subangular blocky structure; friable; patchy thin clay films on peds; about 10 percent by volume sandstone fragments 3 to 10 inches in diameter; very strongly acid; clear wavy boundary.

B3—28 to 38 inches; yellowish red (5YR 5/6) loam; common medium distinct strong brown (7.5YR 5/6) and pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable; about 10 percent by volume sandstone fragments 3 to 10 inches in diameter; very strongly acid; abrupt irregular boundary.

R—38 to 40 inches; sandstone bedrock.

The solum thickness and depth to bedrock range from 20 to 40 inches. Reaction is very strongly acid or strongly acid throughout.

The A horizon ranges from 4 to 6 inches in thickness. The A1 horizon has hue of 10YR, value of 3 or 4, and chroma of 2, 3, or 4. The Ap horizon, where present, has hue of 10YR, value of 4, and chroma of 2, 3, or 4; or it has hue of 10YR, value of 5, and chroma of 3. Some pedons have an A2 horizon that has hue of 10YR, value of 5, and chroma of 3 or 4. Coarse fragments make up 5 to 25 percent, by volume, of the A horizon.

The B1 horizon has hue of 7.5YR, value of 5, and chroma of 6; or it has hue of 5YR, value of 4 or 5, and chroma of 6 or 8. Texture is fine sandy loam, sandy clay loam, or loam. The B2t horizon has hue of 2.5YR or 5YR, value or 4 or 5, and chroma of 6 or 8. Texture is sandy clay loam, clay loam, or loam. Coarse fragments make up as much as 10 percent, by volume, of the B1 and B2t horizons.

The B3 horizon has colors similar to those of the B2t horizon and contains mottles in shades of red, brown, and gray. Texture is similar to the B2t horizon. Coarse fragments make up as much as 25 percent, by volume, of the B3 horizon.

Loring series

The Loring series consists of deep, moderately well drained, nearly level to moderately steep soils that formed in thick deposits of loess. These soils are on terraces and uplands in the Loess Hills and Loess Plains areas. Permeability is moderate above the fragipan and moderately slow in the fragipan. The native vegetation under which these soils formed was mixed hardwood forest. Slopes are 1 to 20 percent.

Loring soils are geographically associated with Calhoun, Calloway, McKamie, Muskogee, Oaklimeter, and Tichnor soils. Calhoun and Calloway soils, on broad flats at lower elevations, are poorly drained and somewhat poorly drained. In addition, Calhoun soils do not have a fragipan. McKamie and Muskogee soils, on similar landscapes, do not have a fragipan. McKamie soils also have a fine control section. Oaklimeter and Tichnor soils, on drainageways, do not have a fragipan. In addition, Tichnor soils are poorly drained, and Oaklimeter soils have a coarse-silty control section.

Typical pedon of Loring silt loam, 3 to 8 percent slopes, in a field in the SW1/4SE1/4SW1/4 sec. 34, T. 2 N., R. 4 W., Prairie County:

Ap—0 to 5 inches; dark brown (10YR 4/3) silt loam; weak medium granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

B1—5 to 10 inches; brown (7.5YR 4/4) silt loam; moderate fine and medium subangular blocky structure; friable; thin patchy clay films; common fine roots; few fine pores; very strongly acid; clear smooth boundary.

B21t—10 to 20 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm; patchy distinct clay films on faces of peds; common fine roots; few fine pores; very strongly acid; clear smooth boundary.

B22t—20 to 26 inches; yellowish brown (10YR 5/6) silty clay loam; common fine distinct grayish brown and strong brown mottles; moderate medium subangular blocky structure; firm; patchy distinct clay films on faces of peds; few fine roots; few fine pores; very strongly acid; clear smooth boundary.

Bx1—26 to 35 inches; yellowish brown (10YR 5/6) silty clay loam; common medium distinct grayish brown (10YR 5/2) and strong brown (7.5YR 5/6) mottles; moderate coarse prismatic parting to moderate medium subangular blocky structure; firm, brittle; patchy distinct clay films on faces of peds within prisms; light brownish gray (10YR 6/2) silt in seams between prisms and on faces of peds; few fine pores; few fine roots in seams; very strongly acid; clear wavy boundary.

Bx2—35 to 58 inches; yellowish brown (10YR 5/4 and 5/6) silt loam; few medium distinct grayish brown (10YR 5/2) and strong brown (7.5YR 5/6) mottles; moderate coarse prismatic parting to moderate medium subangular blocky structure; firm, brittle; patchy distinct clay films on faces of peds within prisms; light brownish gray (10YR 6/2) silt in seams between prisms and on faces of peds; common fine pores; very strongly acid; gradual wavy boundary.

B3—58 to 72 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct light brownish gray (10YR 6/2) and strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; few fine pores; few fine dark concretions; strongly acid.

The solum thickness ranges from 50 to more than 72 inches. Reaction ranges from very strongly acid to medium acid throughout. The depth to the fragipan ranges from 22 to 30 inches.

The A horizon ranges from 4 to 7 inches in thickness. The A horizon has hue of 10YR, value of 4, and chroma of 3 or 4; or it has hue of 10YR, value of 5, and chroma of 4; or it has hue of 7.5YR, value of 4, and chroma of 4.

The B1 and B2 horizons have hue of 7.5YR, value of 5, and chroma of 4 or 6; hue of 7.5YR, value of 4, and chroma of 4; or hue of 10YR, value of 5, and chroma of 4 or 6. Texture is silt loam or silty clay loam.

The Bx horizon has hue of 10YR, value of 5, and chroma of 4 or 6; hue of 10YR, value of 4, and chroma of 4; hue of 7.5YR, value of 5, and chroma of 4 or 6; or it has hue of 7.5YR, value of 4, and chroma of 4. It is mottled in shades of yellow, brown, and gray, or it has an evenly mottled pattern of yellow, brown, and gray. Texture is silt loam or silty clay loam.

The B3 horizon has the same color and texture range as the Bx horizon.

McKamie series

The McKamie series consists of deep, well drained, very slowly permeable, moderately sloping to moderately steep soils that formed in red clayey alluvium. These soils are on terraces in the Loess Hills area. The native vegetation under which these soils formed was mixed hardwood forest. Slopes range from 8 to 20 percent.

McKamie soils are geographically associated with Loring soils. Loring soils, on similar landscapes, have a fragipan and a fine-silty control section.

Typical pedon of McKamie silt loam from an area of Loring-McKamie complex, 8 to 20 percent slopes, in the SE1/4SE1/4SE1/4 sec. 17, T. 3 N., R. 6 W., Prairie County:

Ap—0 to 3 inches; dark brown (10YR 4/3) silt loam; weak medium granular structure; friable; common fine and medium roots; medium acid; abrupt smooth boundary.

B21t—3 to 24 inches; red (2.5YR 4/8) clay; moderate medium subangular blocky structure; very firm; thick patchy clay films on faces of peds; few fine roots; few fine pores; few seams of brown silt loam; few black stains; medium acid; clear wavy boundary.
B22t—24 to 38 inches; red (2.5YR 4/6) clay; moderate fine subangular blocky structure; very firm; thick patchy clay films on faces of peds; reddish yellow silt coatings on faces of some peds; common black stains; slightly acid; clear wavy boundary.
B3—38 to 51 inches; red (2.5YR 4/6) silty clay loam; weak medium subangular blocky structure; firm; few thin patchy clay films on faces of peds; reddish yellow silt coatings on faces of peds; few black stains; common calcium carbonate concretions; calcareous; mildly alkaline; gradual wavy boundary.
C—51 to 72 inches; yellowish red (5YR 4/6) and red (2.5YR 4/6) stratified silty clay loam and silt loam; massive; firm to friable; few streaks and pockets of pale brown and grayish brown silt loam; few black stains; common carbonate concretions; calcareous; moderately alkaline.

The solum thickness ranges from 36 to 60 inches. Reaction ranges from strongly acid to slightly acid in the A horizon. Reaction in the B horizon ranges from strongly acid to medium acid in the upper part and from medium acid to moderately alkaline in the lower part. Reaction in the C horizon ranges from medium acid to moderately alkaline.

The A horizon ranges from about 2 to 6 inches in thickness. The A horizon has hue of 10YR, value of 4, and chroma of 2 or 3; or it has hue of 10YR, value of 5, and chroma of 3.

The B horizon has hue of 2.5YR or 5YR, value of 4, and chroma of 6 or 8. Texture of the B21t and B22t horizons is clay or silty clay. Texture of the B3 horizon is silty clay or silty clay loam.

The C horizon is similar in color to the B horizon. This horizon is commonly stratified. Textures are silty clay loam, silt loam, or very fine sandy loam.

Moreland series

The Moreland series consists of deep, somewhat poorly drained, very slowly permeable soils that formed in clayey alluvium on bottom lands of the Arkansas River. These soils are on broad flats that were backswamps of former streams of the Arkansas River. They have a high water table late in winter and early in spring. The native vegetation under which these soils formed was mixed hardwood forest. Slopes are 0 to 1 percent.

Moreland soils are geographically associated with Perry and Portland soils. Perry and Portland soils, on similar landscapes, do not have a mollic epipedon. In addition, Perry soils are poorly drained.

Typical pedon of Moreland silty clay, 0 to 1 percent slopes, in a field in the SE1/4NE1/4NE1/4 sec. 28, T. 1 S., R. 8 W., Lonoke County:

Ap—0 to 4 inches; dark brown (7.5YR 3/2) silty clay; moderate fine subangular blocky structure; firm; common fine and medium roots; neutral; clear smooth boundary.
A12—4 to 12 inches; dark brown (7.5YR 3/2) silty clay; few fine faint dark reddish brown mottles; moderate fine subangular blocky structure; very firm; common fine roots; neutral; gradual wavy boundary.
B21—12 to 23 inches; dark reddish brown (5YR 3/3) silty clay; common fine faint dark reddish gray mottles; moderate fine subangular blocky structure; very firm; few fine pores; few carbonate concretions; few slickensides which do not intersect; mildly alkaline; gradual wavy boundary.
B22—23 to 43 inches; reddish brown (5YR 4/3) silty clay; common fine faint dark reddish gray mottles; moderate medium subangular blocky structure; very firm; few fine pores; few black stains; common carbonate concretions; few slickensides which do not intersect; calcareous; mildly alkaline; clear wavy boundary.
B3—43 to 72 inches; reddish brown (5YR 4/4) silty clay loam; common fine distinct dark reddish gray and yellowish red mottles; weak medium subangular blocky structure; firm; few fine pores; few black stains; common carbonate concretions; calcareous; moderately alkaline.

The solum thickness is 72 inches or more. The depth to calcareous layers ranges from 20 to 40 inches. Reaction ranges from slightly acid to mildly alkaline in the A horizon and from neutral to moderately alkaline in the B horizon.

The A horizon ranges from 4 to 15 inches in thickness. The A horizon has hue of 5YR, value of 3, and chroma of 2 or 3; or it has hue of 7.5YR, value of 3, and chroma of 2.

The upper part of the B horizon has hue of 5YR, value of 3 or 4, and chroma of 3 or 4. The lower part has hue of 5YR, value of 3, and chroma of 4; or it has hue of 5YR, value of 4, and chroma of 3 or 4. The B2 horizon is silty clay or clay, and the B3 horizon is silty clay loam or silty clay.

Mountainburg series

The Mountainburg series consists of shallow, moderately rapidly permeable, well drained, moderately steep to steep soils on ridgetops and side slopes in the Arkansas Valley area. These soils formed in loamy residuum of sandstone or interbedded sandstone and shale. The native vegetation under which these soils formed was mixed hardwood forest. Slopes range from 12 to 25 percent.

Mountainburg soils are geographically associated with Enders and Linker soils. Enders soils, on similar landscapes, have a clayey control section. Linker soils, also on similar landscapes, have a fine-loamy control section. In addition, Enders and Linker soils are more than 20 inches to bedrock.

Typical pedon of Mountainburg stony fine sandy loam from an area of Linker-Enders-Mountainburg complex, 12 to 25 percent slopes in the SW1/4SW1/4NE1/4 sec. 22, T. 4 N., R. 10 W., Lonoke County:

A1—0 to 3 inches; dark grayish brown (10YR 4/2) stony fine sandy loam; weak medium granular structure; very friable; about 25 percent by volume sandstone fragments 3 to 24 inches or more in diameter; common fine roots; strongly acid; clear smooth boundary.

A2—3 to 9 inches; yellowish brown (10YR 5/4) stony fine sandy loam; weak medium granular structure; very friable; about 25 percent by volume sandstone fragments 1 to 24 inches or more in diameter; few fine roots; very strongly acid; clear wavy boundary.

B2t—9 to 18 inches; strong brown (7.5YR 5/6) very gravelly loam; weak medium subangular blocky structure; very friable; about 40 percent by volume sandstone fragments ranging from 1 to 12 inches or more in diameter; sand grains bridged and coated with clay; very strongly acid; abrupt irregular boundary.

R—18 to 20 inches; sandstone bedrock.

The solum thickness and depth to bedrock range from 12 to 20 inches. Reaction is very strongly acid or strongly acid throughout. Sandstone fragments make up 15 to about 50 percent of the A horizon and 35 to about 60 percent of the Bt horizon.

The A horizon ranges from about 4 to 12 inches in thickness. 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 4 or 5, and chroma of 3 or 4; or it has hue of 10YR, value of 5, and chroma of 6.

The Bt horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 6; or it has hue of 5YR, value of 4, and chroma of 8. Texture is sandy loam, loam, or sandy clay loam or the very gravelly analogue of one of these textures.

Muskogee series

The Muskogee series consists of deep, moderately well drained, slowly permeable, gently sloping soils that formed in a thin silty layer and in underlying clayey sediments. These soils are on uplands and terraces in the Loess Hills and Loess Plains areas. The native vegetation under which these soils formed was mixed hardwood forest. Slopes are 3 to 8 percent.

Muskogee soils are geographically associated with Crowley, Loring, and Stuttgart soils. Crowley soils, on broad flats, have a fine control section and are somewhat poorly drained. Loring soils, on similar landscapes, have a fragipan. Stuttgart soils, on terraces, have an abrupt textural change and a fine control section.

Typical pedon of Muskogee silt loam, 3 to 8 percent slopes in a field in the SW1/4SW1/4SE1/4 sec. 15, T. 3 N., R. 6 W., Prairie County:

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable; many fine roots, few fine pores; few fine concretions; common brown stains; medium acid; abrupt wavy boundary.

B1—4 to 16 inches; yellowish brown (10YR 5/6) silty clay loam; weak medium subangular blocky structure; friable; common fine roots; common fine pores; few fine dark concretions; strongly acid; clear wavy boundary.

B21t—16 to 27 inches; yellowish brown (10YR 5/6) silty clay loam; common medium distinct light brownish gray (10YR 6/2) and yellowish red (5YR 5/6) mottles; moderate medium subangular blocky structure; firm; thin patchy clay films on peds; few fine roots; few fine pores; common medium dark concretions; very strongly acid; clear smooth boundary.

B22t—27 to 42 inches; light brownish gray (10YR 6/2) and yellowish brown (10YR 5/6) silty clay; common medium distinct strong brown (7.5YR 5/6) and yellowish red (5YR 5/6) mottles; moderate medium subangular blocky structure; very firm; thin patchy clay films on peds; few fine roots; few fine pores; common medium dark concretions; very strongly acid; clear smooth boundary.

B23t—42 to 72 inches; yellowish brown (10YR 5/6) and light brownish gray (10YR 6/2) silty clay; common medium distinct strong brown (7.5YR 5/6) and few fine distinct yellowish red and red mottles; moderate medium subangular blocky structure; very firm; thin patchy clay films on peds; few fine pores; common medium dark concretions; strongly acid.

The solum thickness ranges from 60 to more than 72 inches. Reaction ranges from very strongly acid to medium acid in the A horizon and upper part of the B horizon. Reaction in the lower part of the B horizon ranges from strongly acid to slightly acid.

The total thickness of the A horizon ranges from about 4 to 10 inches. The Ap horizon has hue of 10YR, value of 4, and chroma of 2 or 3. The A2 horizon, where present, has hue of 10YR, value of 5 or 6, and chroma of 3 or 4.

The B1 horizon has hue of 10YR, value of 5, and chroma of 4 or 6. The B21t horizon has hue of 10YR, value of 5, and chroma of 4, 6, or 8; or it has hue of 7.5YR, value of 5, and chroma of 6 or 8. In addition, the B21t horizon has few to common mottles of chroma 2 or less. Texture of the B1 and B21t horizons is silt loam or silty clay loam.

The B22t and B23t horizons have hue of 10YR, value of 6, and chroma of 1 or 2 and have common to many mottles in shades of red, yellow, and brown. In some pedons, red or brown colors are dominant, and mottles are of grayer colors. Other pedons are mottled and have no dominant color. Texture of the B22t and B23t horizons is silty clay or clay.

Oaklimeter series

This series consists of deep, moderately well drained, moderately permeable soils which formed in loamy alluvium. These soils are on flood plains of streams in the Loess Hills area. The native vegetation under which these soils formed was mixed hardwood forest. Slopes are 0 to 2 percent.

These soils are geographically associated with Loring soils. Loring soils, on uplands at higher elevations, have a fragipan and a fine-silty control section.

Typical pedon of Oaklimeter silt loam, occasionally flooded, in a field in the SE1/4NE1/4NE1/4 sec. 26, T. 3 N., R. 6 W., Prairie County:

Ap—0 to 5 inches; dark brown (10YR 4/3) silt loam; weak medium granular structure; friable; common fine roots; medium acid; abrupt smooth boundary.

B21—5 to 14 inches; brown (10YR 5/3) silt loam; weak medium subangular blocky structure; friable; common fine roots; few fine pores; few fine black and brown stains; strongly acid; clear wavy boundary.

B22—14 to 26 inches; yellowish brown (10YR 5/4) silt loam; common fine distinct grayish brown and pale brown mottles; weak medium subangular blocky structure; friable; few fine roots; few fine pores; few fine black and brown stains; very strongly acid; clear wavy boundary.

B23—26 to 36 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct light brownish gray (10YR 6/2) and light yellowish brown (10YR 6/4) mottles; weak medium subangular blocky structure; friable; few fine pores; few fine black and brown stains; few fine dark concretions; very strongly acid; clear wavy boundary.

B24b—36 to 56 inches; light brownish gray (10YR 6/2) and yellowish brown (10YR 5/4) silt loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak coarse prismatic parting to weak medium subangular blocky structure; friable; few fine pores; common fine black and brown stains; few fine dark concretions; very strongly acid; gradual wavy boundary.

B3gb—56 to 72 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct yellowish brown (10YR 5/4, 5/6) and strong brown (7.5YR 5/6) mottles; weak coarse prismatic parting to weak medium subangular blocky structure; friable; few fine pores; common fine black stains; few fine dark concretions; very strongly acid.

The solum thickness ranges from 60 to 72 inches or more. Reaction is strongly acid or very strongly acid throughout except for surface layers that have been limed.

The Ap horizon ranges from 4 to 7 inches in thickness. The Ap horizon has hue of 10YR, value of 4, and chroma of 2, 3, or 4.

The B21 horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. The B22 horizon has matrix colors similar to the B21 horizon except that it has few to common grayish mottles. The B23 horizon has matrix colors similar to the B21 horizon and has common mottles in shades of gray, or it has matrix colors that have hue of 10YR, value of 5 or 6, and chroma of 2. The B24b and B3gb horizons have hue of 10YR, value of 5 or 6, and chroma of 1 or 2 and have mottles in shades of brown. Texture of the B horizon is silt loam or loam.

Perry series

The Perry series consists of deep, poorly drained, very slowly permeable soils that formed in clayey alluvium on bottom lands of the Arkansas River. These soils are on broad flats and in depressions that were backswamps of the Arkansas River. They have a high water table late in winter and early in spring. The native vegetation under which these soils formed was mixed hardwood forest. Slopes are 0 to 1 percent.

Perry soils are geographically associated with Hebert, Moreland, Portland, Rilla, and Yorktown soils. Hebert and Rilla soils, on natural levees, have fine-silty control sections and are better drained. Moreland soils, on similar landscapes, have mollic epipedons and are somewhat poorly drained. Portland soils, also on similar landscapes, have browner colors in the upper part of the subsoil and are somewhat poorly drained. Yorktown soils, on ponded backswamp areas, are flooded for at least 10 months of most years and do not crack.

Typical pedon of Perry silty clay, 0 to 1 percent slopes, in a field in the NE1/4NE1/4SW1/4 sec. 24, T. 2 S., R. 8 W., Lonoke County:

Ap—0 to 4 inches; dark gray (10YR 4/1) silty clay; few fine distinct strong brown mottles; weak medium subangular blocky structure; firm; common fine roots; medium acid; abrupt smooth boundary.

B21g—4 to 23 inches; gray (10YR 5/1) clay; common medium distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; very firm; few fine roots; few slickensides which do not intersect; few black stains; medium acid; clear smooth boundary.

B22g—23 to 34 inches; dark gray (10YR 4/1) clay; few fine distinct strong brown and reddish brown mottles; moderate medium subangular blocky structure; very firm; few fine roots; few slickensides which do not intersect; slightly acid; clear wavy boundary.

IIB3—34 to 54 inches; reddish brown (5YR 4/3) clay; common fine faint dark reddish gray mottles; moderate medium subangular blocky structure; very firm; few slickensides which do not intersect; common carbonate concretions; mildly alkaline; gradual wavy boundary.

IIC—54 to 72 inches; reddish brown (5YR 4/3) silty clay; common medium faint dark reddish gray (5YR 4/2) and distinct yellowish red (5YR 4/6) mottles; weak medium subangular blocky structure; very firm; common carbonate concretions; calcareous; moderately alkaline.

The solum thickness ranges from 30 to about 60 inches. The depth to the IIB horizon ranges from 20 to 36 inches. Reaction is strongly acid or medium acid in the A horizon, strongly acid to neutral in the B2g horizon, and slightly acid to moderately alkaline in the IIB horizon. The IIC horizon is mildly alkaline or moderately alkaline and is calcareous.

The A horizon ranges from 4 to 6 inches in thickness. The A horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2.

The B2g horizon has hue of 10YR, value of 4, 5, or 6, and chroma of 1. It has few to many brownish mottles. The IIB3 horizon has hue of 5YR, value of 3 or 4, and chroma of 2, 3, or 4.

The IIC horizon has hue of 5YR, value of 4 or 5, and chroma of 3 or 4. Mottles in shades of red and gray range from few to common. Texture is clay or silty clay.

Portland series

The Portland series consists of deep, somewhat poorly drained, very slowly permeable soils that formed in clayey slackwater deposits in bottom lands of the Arkansas River. These soils are on broad flats that were backswamps of the Arkansas River. They have a high water table late in winter and early in spring. The native vegetation under which these soils formed was mixed hardwood forest. Slopes are 0 to 1 percent.

Portland soils are geographically associated with Hebert, Moreland, Perry, and Rilla soils. Hebert and Rilla soils, on natural levees, have fine-silty control sections. Perry soils, on similar landscapes, are poorly drained. Moreland soils, on similar landscapes, have a mollic epipedon.

Typical pedon of Portland silty clay, 0 to 1 percent slopes, in a field in the NW1/4NE1/4NE1/4 sec. 33, T. 2 S., R. 9 W., Lonoke County:

Ap—0 to 3 inches; dark brown (10YR 3/3) silty clay; common fine distinct strong brown mottles; moderate fine subangular blocky structure; firm; many fine and medium roots; medium acid; abrupt smooth boundary.

B21—3 to 14 inches; brown (7.5YR 4/4) clay; common medium distinct grayish brown (10YR 5/2) and yellowish red (5YR 5/6) mottles; moderate fine subangular blocky structure; firm; common fine and medium roots; few fine pores; very strongly acid; clear wavy boundary.

B22—14 to 22 inches; reddish brown (5YR 4/4) clay; common fine faint yellowish red mottles; moderate fine subangular blocky structure; very firm; few fine roots; few fine pores; few slickensides that do not intersect; common small shiny pressure faces; strongly acid; gradual wavy boundary.

B23—22 to 46 inches; reddish brown (5YR 4/3) clay; moderate fine subangular blocky structure; very firm; few fine pores; few slickensides that do not intersect; common small shiny pressure faces; few carbonate concretions; neutral; gradual wavy boundary.

B3—46 to 62 inches; reddish brown (5YR 4/4) silty clay loam; weak medium subangular blocky structure; firm; common carbonate concretions; calcareous; mildly alkaline; clear wavy boundary.

C1—62 to 72 inches; brown (7.5YR 5/4) loam that has small pockets or veins of reddish brown (5YR 4/4) silty clay loam; massive; friable; mildly alkaline.

The solum thickness ranges from about 38 to 72 inches or more. Reaction is very strongly acid or strongly acid in the A horizon and upper part of the B horizon, except where the surface layer has been limed. Reaction in the lower part of the B horizon and in the C horizon ranges from slightly acid to moderately alkaline.

The A horizon ranges from 2 to 8 inches in thickness. The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3; or it has hue of 7.5YR, value of 4, and chroma of 2 or 4.

The B horizon has hue of 5YR, value of 4, and chroma of 3 or 4; or it has hue of 7.5YR, value of 4 or 5, and chroma of 4. The upper part of the B horizon has few to common mottles in shades of gray, brown, or red. Texture is silty clay or clay in the B2 horizon and silty clay or silty clay loam in the B3 horizon.

The C horizon has hue of 5YR, value of 4 or 5, and chroma of 4 or 6; or it has hue of 7.5YR, value of 4 or 5, and chroma of 4. Textures are loam, very fine sandy loam, silt loam, or silty clay loam.

Rilla series

The Rilla series consists of deep, well drained, moderately permeable soils that formed in loamy alluvium in bottom lands of the Arkansas River. These soils are on higher parts of older natural levees bordering abandoned stream channels of the Arkansas River. The native vegetation under which these soils formed was mixed hardwood forest. Slopes are 0 to 3 percent.

Rilla soils are geographically associated with Caspiana, Hebert, Perry, and Portland soils. Caspiana soils, on similar landscapes, have a mollic epipedon.

Hebert soils, on the lower parts of natural levees, are somewhat poorly drained. Perry and Portland soils, on backswamp areas, have very-fine control sections and are more poorly drained.

Typical pedon of Rilla silt loam, 0 to 1 percent slopes, in a field in the SE1/4SE1/4NE1/4 sec. 25, T. 1 S., R. 9 W., Lonoke County:

Ap—0 to 6 inches; dark brown (10YR 4/3) silt loam; weak medium granular structure; friable; common fine and medium roots; medium acid; abrupt smooth boundary.

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

B2t—12 to 38 inches; reddish brown (5YR 4/4) silty clay loam; moderate medium and coarse subangular blocky structure; firm; thin pale brown (10YR 6/3) silt coatings on faces of peds; few thin patchy clay films on peds; common fine pores; very strongly acid; gradual wavy boundary.

B3—38 to 55 inches; yellowish red (5YR 4/6) silt loam; weak medium subangular blocky structure; friable; few thin patchy clay films; few fine pores; small pockets and streaks of pale brown loam; very strongly acid; gradual wavy boundary.

C—55 to 72 inches; yellowish red (5YR 4/6) loam; massive; very friable; common pale brown (10YR 6/3) fine sandy loam pockets and streaks; strongly acid.

The solum thickness ranges from 40 to 60 inches. Reaction ranges from very strongly acid to neutral in the A horizon, is very strongly acid or strongly acid in the B horizon, and ranges from strongly acid to mildly alkaline in the C horizon.

The A horizon ranges from 6 to 16 inches in thickness. The A horizon has hue of 10YR, value of 4 or 5, and chroma of 3; or it has hue of 7.5YR, value of 4 or 5, and chroma of 2.

The B horizon has hue of 5YR, value of 4 or 5, and chroma of 3, 4, or 6; or it has hue of 7.5YR, value of 4 or 5, and chroma of 4. Texture of the B2t horizon is silt loam or silty clay loam. Texture of the B3 horizon is loam, silt loam, or silty clay loam.

The C horizon is similar in color to the B horizon. Texture of the C horizon is similar to the B3 horizon.

Sacul series

The Sacul series consists of deep, moderately well drained, slowly permeable, gently sloping soils that formed in stratified loamy and clayey marine sediment. These soils are on uplands of the Coastal Plains. The native vegetation under which they formed was mixed hardwood and pine forest. Slopes range from 3 to 8 percent.

Sacul soils are geographically associated with Leadvale, Sawyer, and Smithdale soils. Leadvale soils, on similar landscapes, have a fragipan and a fine-silty control section. Sawyer soils, on similar landscapes, have a fine-silty control section. Smithdale soils, on similar landscapes, have a fine-loamy control section.

Typical pedon of Sacul fine sandy loam, 3 to 8 percent slopes, in a field in the SE1/4NW1/4SE1/4 sec. 20, T. 3 N., R. 9 W., Lonoke County:

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

A2—4 to 9 inches; yellowish brown (10YR 5/4) fine sandy loam; weak medium subangular blocky structure; very friable; common fine roots; strongly acid; clear smooth boundary.

B21t—9 to 20 inches; red (2.5YR 4/8) silty clay; moderate medium angular blocky structure; firm; patchy distinct clay films on faces of peds; few fine roots; very strongly acid; gradual wavy boundary.

B22t—20 to 32 inches; red (2.5YR 4/6) silty clay; common medium prominent light brownish gray (10YR 6/2) and distinct yellowish brown (10YR 5/4) mottles; moderate medium angular blocky structure; firm; patchy distinct clay films on faces of peds; few fine dark concretions; very strongly acid; gradual wavy boundary.

B23t—32 to 42 inches; mottled red (2.5YR 4/6), light brownish gray (10YR 6/2), and yellowish brown (10YR 5/4, 5/6) silty clay; moderate medium angular blocky structure; firm; patchy distinct clay films on faces of peds; few fine dark concretions; very strongly acid; gradual wavy boundary.

B3—42 to 56 inches; mottled light brownish gray (10YR 6/2), red (2.5YR 4/6), and yellowish brown (10YR 5/4, 5/6) silty clay loam; moderate medium subangular blocky structure; firm; few pockets and streaks of fine sandy loam; very strongly acid; gradual wavy boundary.

C—56 to 72 inches; mottled light brownish gray (10YR 6/2), red (2.5YR 4/6), and strong brown (7.5YR 5/6) stratified fine sandy loam and clay loam; massive; friable; few pockets of silt loam; very strongly acid.

The solum thickness ranges from 40 to more than 72 inches. Reaction is strongly acid or very strongly acid throughout. Fragments of ironstone or sandstone, 2 to 75 millimeters in diameter, make up as much as 10 percent, by volume, of the surface layer.

Total thickness of the A horizon ranges from about 4 to 12 inches. The A1 or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. The A2 horizon, where present, has hue of 10YR, value of 4, 5, or 6, and chroma of 3 or 4.

The B21t and B22t horizons have hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8. The B22t horizon has common mottles in shades of gray. Texture of the B21t and B22t horizons is silty clay or clay. The B23t horizon is mottled in shades of gray, red, and brown; or red or gray colors may be dominant. Texture is silty clay or silty clay loam. The B3 horizon has matrix colors similar to the B23t horizon. Texture is silty clay loam, clay loam, sandy clay loam, or silt loam.

The C horizon, where present, is mottled red, yellow, and gray. It commonly is stratified. Texture is clay loam, sandy clay loam, or sandy loam.

Sawyer series

The Sawyer series consists of deep, moderately well drained, slowly permeable, gently sloping soils that formed in loamy and clayey marine sediments. These soils are on uplands of the Coastal Plain area. The native vegetation under which these soils formed was mixed hardwood and pine forest. Slopes range from 3 to 8 percent.

Sawyer soils are geographically associated with Leadvale and Sacul soils. Leadvale soils, on similar landscapes, have a fragipan. Sacul soils, on similar landscapes, have a clayey control section.

Typical pedon of Sawyer silt loam, 3 to 8 percent slopes, in a field in the NW1/4SW1/4SE1/4 sec. 7, T. 4 N., R. 9 W., Lonoke County:

Ap—0 to 5 inches; dark brown (10YR 4/3) silt loam; weak medium granular structure; friable; many fine roots; few fine dark concretions; few brown stains; strongly acid; abrupt smooth boundary.

B21t—5 to 18 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm; common fine roots; thin patchy clay films on peds; few fine pores; few fine dark concretions; strongly acid; gradual smooth boundary.

B22t—18 to 32 inches; yellowish brown (10YR 5/6) silty clay loam; common fine distinct gray and prominent red mottles; moderate medium subangular blocky structure; firm; thin patchy clay films on peds; few fine pores; few fine dark concretions; very strongly acid; clear smooth boundary.

B23t—32 to 48 inches; mottled red (2.5YR 4/6), gray (10YR 6/1), and yellowish brown (10YR 5/6) silty clay; moderate medium subangular blocky structure; firm, plastic; patchy thin clay films on peds; few fine pores; few fine dark concretions; very strongly acid; gradual smooth boundary.

B24t—48 to 72 inches; gray (10YR 6/1) clay; common medium distinct yellowish brown (10YR 5/6) and prominent red (2.5YR 4/6) mottles; moderate medium angular blocky structure; firm, plastic; thin patchy clay films on peds; few fine pores; few fine dark concretions; very strongly acid.

The solum thickness ranges from 60 to 72 inches or more. Reaction is very strongly acid or strongly acid throughout.

The A horizon ranges from 4 to 10 inches in thickness. The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3.

The B21t horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 6 or 8; or it has hue of 10YR, value of 5, and chroma of 4. Texture is silt loam, loam, clay loam, or silty clay loam.

The B22t horizon is similar in color and texture to the B21t horizon. The B22t horizon has common to many mottles in shades of gray and few to common mottles in shades of yellowish red or red.

The B23t and B24t horizons are mottled red, brown, and gray; or one of these colors is dominant, mottled with the other two. The red colors have hue of 5YR, value of 4 or 5, and chroma of 6 or 8; or they have hue of 2.5YR, value of 4, and chroma of 6 or 8. The brown colors have hue of 10YR or 7.5YR, value of 5, and chroma of 6 or 8. The gray colors have hue of 10YR, value of 5 or 6, and chroma of 1 or 2. Texture is silty clay or clay. Depth to the silty clay or clay textures is 22 to 40 inches.

Smithdale series

The Smithdale series consists of deep, well drained, moderately permeable, gently sloping soils that formed in loamy sediment. These soils are on uplands of the Coastal Plain. The native vegetation under which these soils formed was mixed hardwood and pine forest. Slopes are 5 to 8 percent.

Smithdale soils are geographically associated with Leadvale and Sacul soils. Leadvale soils, on uplands at slightly lower elevations, have a fragipan. Sacul soils, on similar landscapes, have a clayey control section.

Typical pedon of Smithdale sandy loam, 5 to 8 percent slopes, in a field in the NW1/4SE1/4SE1/4 sec. 20, T. 4 N., R. 9 W., Lonoke County:

Ap—0 to 4 inches; dark brown (10YR 4/3) sandy loam; weak medium granular structure; very friable; common fine roots; few gravel fragments 1/2 inch to 2 inches in diameter; strongly acid; clear wavy boundary.

A2—4 to 12 inches; yellowish brown (10YR 5/4), sandy loam; weak medium granular structure; very friable; common fine roots; few gravel fragments 1/2 inch to 2 inches in diameter; strongly acid; clear smooth boundary.

B21t—12 to 30 inches; yellowish red (5YR 4/8) clay loam; moderate fine and medium subangular blocky structure; friable; common thin patchy distinct clay films on faces of peds; few fine roots; few gravel fragments 1/2 inch to 2 inches in diameter; strongly acid; gradual wavy boundary.

B22t—30 to 52 inches; red (2.5YR 4/8), sandy clay loam; moderate fine and medium subangular blocky structure; friable; common thin patchy faint clay films on faces of peds; sand grains bridged and coated with clay; few pockets of uncoated sand grains; few pockets of strong brown loam; few fine gravel fragments 1/2 inch to 2 inches in diameter; strongly acid; gradual wavy boundary.

B23t—52 to 72 inches; red (10R 4/8) sandy clay loam; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; few pockets of uncoated sand grains; few pockets of strong brown loam; few fine gravel fragments 1/2 inch to 2 inches in diameter; strongly acid.

The solum thickness ranges from 60 to more than 80 inches. Reaction is very strongly acid or strongly acid throughout.

The total thickness of the A horizon ranges from 8 to 18 inches. The A1 or Ap horizon has hue of 10YR, value of 4, and chroma of 2 or 3. The A2 horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4.

The B horizon has hue of 5YR, 2.5YR, or 10R; value of 4; and chroma of 6 or 8. The upper part of the B2t horizon is clay loam, sandy clay loam, or loam. The lower part of the B2t horizon is sandy clay loam or loam and has few to common pockets of uncoated sand grains.

Stuttgart series

The Stuttgart series consists of deep, moderately well drained, level to nearly level soils that formed in thick loess and thin loess-like material underlain by clayey alluvium. These soils are on broad flats and terraces in the Loess Plains area. Permeability is very slow. The native vegetation under which these soils formed was mainly tall prairie grasses, but some areas were in mixed hardwood forest. Slopes range from 0 to 3 percent.

Stuttgart soils are geographically associated with Crowley and Muskogee soils. Crowley soils, on similar landscapes at slightly lower elevations, are somewhat poorly drained. Muskogee soils, on gently sloping uplands, do not have an abrupt textural change and have a fine-silty control section.

Typical pedon of Stuttgart silt loam, 0 to 1 percent slopes, in a field in the SE1/4SE1/4SW1/4 sec. 29, T. 1 N., R. 5 W., Prairie County:

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam; weak medium granular structure; friable; common fine and medium roots; common brown stains; few fine dark brown concretions; medium acid; abrupt smooth boundary.

A12—5 to 10 inches; grayish brown (10YR 5/2) silt loam; common fine distinct yellowish brown mottles; weak medium subangular blocky structure; friable; common fine roots; common brown stains; few fine dark brown concretions; medium acid; clear smooth boundary.

A2—10 to 20 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct grayish brown (10YR 5/2) and strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; few fine roots; few fine pores; few fine dark brown concretions; strongly acid; abrupt smooth boundary.

B21t—20 to 31 inches; red (2.5YR 4/6) silty clay; common medium prominent grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; very firm; patchy distinct clay films; few fine roots; few fine pores; few fine dark brown concretions; strongly acid; gradual wavy boundary.

B22t—31 to 47 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct strong brown (7.5YR 5/6) and faint light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; firm; patchy distinct clay films; few fine pores; common fine dark brown concretions; few fine black and brown stains; strongly acid; gradual wavy boundary.

B3—47 to 72 inches; light brownish gray (10YR 6/2) silty clay loam; common medium distinct strong brown (7.5YR 5/6) and gray (10YR 5/1) mottles; weak medium subangular blocky structure; firm; patchy faint clay films; few fine pores; common dark brown concretions; common black stains; medium acid.

The solum thickness ranges from about 50 to 72 inches or more. Reaction is strongly acid or medium acid in the A horizon. Reaction in the B horizon ranges from strongly acid to medium acid in the upper part and from strongly acid to mildly alkaline in the lower part. Depth to the abrupt textural change ranges from about 18 to 28 inches.

The Ap and A1 horizons have hue of 10YR, value of 4 or 5, and chroma of 2 or 3; or they have hue of 10YR, value of 4, and chroma of 4.

The A2 horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. The lower part of the A2 commonly has mottles of chroma 2; or the lower 1 to 3 inches has a matrix of chroma 2. In some pedons the A2 has strong brown or yellowish red mottles.

The B21t horizon has hue of 5YR or 2.5YR, value of 4, and chroma of 6 or 8 with common to many grayish mottles. In some pedons, the B21t is equally mottled in shades of red and gray. Texture is silty clay or silty clay loam.

The B22t horizon, the B23t horizon, if present, and the B3 horizon have hue of 10YR, value of 5 or 6, and chroma of 1 or 2 and have common to many mottles in shades of red, yellow, and brown. Texture is silty clay loam or silt loam.

Taft series

The Taft series consists of deep, somewhat poorly drained, slowly permeable, level to nearly level soils that formed in loamy alluvium. These soils are on upland flats and terraces and in depressions in the Arkansas Valley area. The native vegetation under which these soils formed was mixed hardwood forest. Slopes range from 0 to 2 percent.

Taft soils are geographically associated with Amy and Leadvale soils. Amy soils, on flood plains, are poorly drained and do not have a fragipan. Leadvale soils, on terraces and toe slopes at slightly higher elevations, are moderately well drained.

Typical pedon of Taft silt loam, 0 to 2 percent slopes, in a field in the SE1/4NE1/4NW1/4 sec. 14, T. 4 N., R. 10 W., Lonoke County:

Ap—0 to 6 inches; brown (10YR 4/3) silt loam; weak medium granular structure; very friable; common fine roots; medium acid; clear smooth boundary.

B2—6 to 28 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct light brownish gray (10YR 6/2) and pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable; few fine roots; few fine pores; strongly acid; clear smooth boundary.

A'2—28 to 32 inches; light yellowish brown (2.5Y 6/4) and light brownish gray (2.5Y 6/2) silt loam; weak fine subangular blocky structure; friable; few pockets and streaks of light gray silt; very strongly acid; clear irregular boundary.

B'x1—32 to 60 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct strong brown (7.5YR 5/6) and gray (10YR 6/1) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; brittle, firm; common patchy distinct clay films on faces of peds; common veins of gray silt and silty clay loam; few fine dark concretions; very strongly acid; gradual wavy boundary.

B'x2—60 to 72 inches; mottled yellowish brown (10YR 5/4), gray (10YR 6/1), and strong brown (7.5YR 5/6) silt loam; weak coarse prismatic structure parting to weak medium subangular blocky; brittle, firm; common patchy distinct clay films on faces of peds; common veins of light gray silty clay loam; few fine dark concretions; very strongly acid.

The solum thickness ranges from 50 to 72 inches or more. Reaction is very strongly acid or strongly acid throughout except where the soil has been limed. Depth to the fragipan ranges from about 20 to 36 inches.

The A horizon ranges from about 4 to 10 inches in thickness. The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. The A2 horizon, where present, has hue of 10YR, value of 5 and chroma of 3 or 4, or it has hue of 10YR, value of 6, and chroma of 3.

The B2 horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. Common to many mottles in shades of gray are present. Texture is silt loam or silty clay loam.

The A'2 horizon has hue of 10YR, value of 5 or 6, and chroma of 2, 3, or 4. Texture is silt or silt loam.

The B'x horizon has hue of 10YR, or 2.5Y, value of 5, and chroma of 4; or it has an evenly mottled pattern of gray, brown, and yellow. Texture is silt loam or silty clay loam.

Tichnor series

The Tichnor series consists of deep, poorly drained, slowly permeable soils that formed in loamy alluvium. These soils are on flood plains of streams in the Loess Hills and Loess Plains. They have a high water table in the winter and early spring. The native vegetation under which these soils formed was mixed hardwood forest. Slopes are 0 to 1 percent.

Tichnor soils are geographically associated with Calhoun, Calloway, and Loring soils. Calhoun soils, on broad flats, have glossic properties and a thinner A horizon. Calloway soils, on broad flats and terraces, are somewhat poorly drained and have a fragipan. Loring soils, on uplands and terraces, are moderately well drained and have a fragipan.

Typical pedon of Tichnor silt loam, frequently flooded, in a field in the SE1/4SW1/4NW1/4 sec. 24, T. 3 N., R. 7 W., Lonoke County:

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam; weak medium granular structure; friable; common fine roots; few fine dark concretions; medium acid; clear smooth boundary.

A21g—5 to 12 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct strong brown (7.5YR 5/6) and brown (10YR 4/3) mottles; weak medium subangular blocky structure; friable; few fine roots; few fine pores; common fine dark concretions; strongly acid; clear smooth boundary.

A22g—12 to 30 inches; gray (10YR 6/1) silt loam; common medium distinct strong brown (7.5YR 5/6) and yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; friable; few fine roots; few fine pores; few fine dark concretions; very strongly acid; gradual wavy boundary.

B21tg—30 to 41 inches; light brownish gray (10YR 6/2) silty clay loam; common medium distinct strong brown (7.5YR 5/6) and gray (10YR 5/1) mottles; moderate medium subangular blocky structure; firm; common thin clay films on peds and in pores; few fine roots; few fine pores; few fine dark concretions; few pockets and streaks of light gray silt; very strongly acid; gradual wavy boundary.

B22tg—41 to 68 inches; gray (10YR 6/1) silty clay loam; common medium distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; common thin clay films on peds; few fine pores; few fine dark concretions; few pockets and streaks of light gray silt; strongly acid; gradual wavy boundary.

B3g—68 to 72 inches; light brownish gray (10YR 6/2) and light gray (10YR 7/1) silt loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable;

few patchy thin clay films; few fine pores; common fine dark concretions; strongly acid.

The solum thickness ranges from 60 to 72 inches or more. Reaction ranges from very strongly acid to medium acid throughout.

The A horizon is 20 to 37 inches thick. The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2. The A1 horizon has hue of 10YR, value of 4, and chroma of 2 or 3. The A2g horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. Mottles in shades of brown range from few to common.

The B2tg and B3g horizons have hue of 10YR, value of 6 or 7, and chroma of 1 or 2; or they have hue of 10YR, value of 5, and chroma of 1. Texture is silt loam or silty clay loam. Mottles in shades of brown range from few to common.

Yorktown series

The Yorktown series consists of deep, very poorly drained, very slowly permeable, level soils that formed in clayey alluvium. These soils are in low, ponded backswamps and abandoned oxbows on bottom lands of the Arkansas River. They are under 6 inches or more of water at least 10 months of most years. The native vegetation under which these soils formed was baldcypress and water tupelo. Slopes are 0 to 1 percent.

Yorktown soils are geographically associated with Perry soils. Perry soils, on backswamp areas, are not ponded and crack to a depth of 20 inches in most years.

Typical pedon of Yorktown silty clay, in the NE1/4SE1/4NW1/4 sec. 3, T. 1 S., R. 10 W., Lonoke County:

O1—2 inches to 0; dark brown (7.5YR 3/2) partially decomposed leaves, twigs, and roots; medium acid; abrupt smooth boundary.

A1—0 to 6 inches; gray (10YR 5/1) silty clay; common medium distinct strong brown (7.5YR 5/6) mottles; weak coarse subangular blocky structure; very sticky, firm; many fine roots; medium acid; clear smooth boundary.

B21g—6 to 28 inches; gray (10YR 5/1) clay; common medium distinct strong brown (7.5YR 5/6) mottles; weak coarse subangular blocky structure; very sticky, very firm; common fine roots; common fine black concretions; medium acid; clear wavy boundary.

B22g—28 to 44 inches; dark gray (10YR 4/1) clay; common medium distinct strong brown (7.5YR 5/6) and few fine distinct yellowish red mottles; weak coarse subangular blocky structure; very sticky, very firm; few fine roots; few fine black concretions; slightly acid; clear smooth boundary.

IIB3—44 to 60 inches; reddish brown (5YR 4/4) clay; common fine distinct yellowish red and gray mottles; moderate fine blocky structure; sticky, very firm; few fine root remnants; common fine black bodies; mildly alkaline.

The solum thickness ranges from 50 to 80 inches. Depth to the IIB3 horizon ranges from 40 to 60 inches. Reaction ranges from medium acid to neutral in the A and B2g horizons and is mildly alkaline or moderately alkaline in the IIB3 horizon.

The A horizon is 4 to 8 inches thick. It has hue of 10YR, value of 4, 5, or 6, and chroma of 1.

The B2g horizons have hue of 5Y or 10YR, value of 4, 5, or 6, and chroma of 1. They have few to many strong brown or yellowish red mottles.

The IIB3 horizon has hue of 5YR, value of 4 or 5, and chroma of 3 or 4. It has few to common gray and yellowish red mottles.

formation of the soils

In this section the factors of soil formation are discussed and related to the soils in the survey area. In addition, the processes of soil formation are described.

factors of soil formation

Soil is formed by weathering and other processes. The characteristics of the soil at any given point depend upon climate, living organisms, parent material, relief, and time. Each factor modifies the effect of the other four (*5*). When climate, living organisms, or any other one of the five factors is varied to a significant extent, a different soil may be formed.

Climate and living organisms are the active forces in soil formation. Relief, mainly by its influence on temperature and runoff, modifies the effects of climate and living organisms. The parent material also affects the kind of soil that can be formed. Time is needed to change the parent material into soil.

The interaction of the five factors of soil formation is more complex for some soils than for others. The five factors and how they have interacted to form some of the soils in Lonoke and Prairie Counties are discussed in the following paragraphs.

climate

The climate of Lonoke and Prairie Counties is characterized by warm summers, mild winters, and fairly abundant rainfall. The generally warm temperatures and high precipitation probably are similar to the climate under which the soils in the county formed. The average daily temperature in July is about 81.5 degrees F. and in January is about 39.5 degrees F. The total annual rainfall is about 52 inches and is well distributed throughout the year. For additional information about the climate, refer to the section "General nature of the survey area".

The warm, moist climate of this area promotes rapid soil formation. The warm temperature encourages rapid chemical reactions. The large volume of water that moves through the soil is instrumental in removing dissolved or suspended materials. Because plant remains decompose rapidly, the organic acids thus formed hasten the removal of carbonates and the formation of clay minerals. Because the soil is frozen only to shallow depths and for relatively short periods, soil formation continues almost the year round. The climate throughout the survey area is relatively uniform, though its effect is modified locally by runoff and slope aspect.

living organisms

The higher plants and animals, as well as insects, bacteria, and fungi, are important in the formation of soils. Among the effects of living organisms are the addition of organic matter and nitrogen to the soil, gains or losses in plant nutrients, and changes in soil structure and porosity.

Before Lonoke and Prairie Counties were settled, the native vegetation had more influence on soil formation than did animal activity.

Hardwood forests covered most of the bottom land area in both counties. On the flood plains and natural levees, the trees were mainly oaks, sweetgum, ash, sycamore, and hickories. Hebert, Keo, Rilla, Dubbs, Commerce, and Tichnor soils formed in these areas. In slackwater areas or swamps, the main trees were baldcypress, water tupelo, and water-tolerant hardwoods. Perry, Portland, and Kobel soils formed in these areas.

On the uplands, the forests were mainly mixed stands of hardwoods or hardwoods and pines. Soils such as Loring, Calloway, Leadvale, Taft, Sawyer, Sacul, Enders, and Linker formed in these areas.

A part of both counties was almost treeless but had a few scattered wooded areas. The native vegetation is believed to have been of a prairie or savannah type. The Crowley, Stuttgart, and some of the Calhoun soils formed in this area. These soils, however, do not have the thick, dark colored surface layer commonly associated with soils formed under this type of vegetation.

In most cases the soil characteristics were influenced more by parent material, climate, and relief than by vegetation.

Man is important to the future rate and direction of soil formation. He clears the forest, cultivates the soils, and introduces new kinds of plants. He adds fertilizer, lime, and chemicals for insect, disease, and weed control. Such human activities as building levees and dams for flood control, improving drainage, and grading the soil surface also affect the future development of soils. Some results of these changes will not be evident for many centuries. Nevertheless, the complex of living organisms affecting soil formation in this county has been drastically changed by man. Thus, man has become the most important organism affecting soil formation.

parent material

The soils of Lonoke and Prairie Counties formed in four broad classes of parent material: alluvium deposited by major streams, loess blown from older Mississippi Valley alluvial surfaces, coastal plain sediments deposited when the Gulf of Mexico covered southern and eastern Arkansas, and residuum of interbedded sandstone and shale.

In the southern part of Lonoke County, the parent material is alluvium deposited by the Arkansas River. This alluvium is a mixture of minerals that washed downstream from the Arkansas River basin, which extends from the Rocky Mountains and includes parts of Colorado, New Mexico, Texas, Kansas, Oklahoma, and Arkansas. In the eastern part of Prairie County, the parent material is alluvium deposited by the Mississippi River when it flowed in channels now occupied by the White and Cache Rivers. This alluvium is a mixture of minerals that washed downstream from the Mississippi River basin, which extends from Montana to Pennsylvania.

The wide range in texture of alluvium in both counties results from the differences in the site of deposition. When a river overflowed and spread over its flood plain, the coarser sediment was deposited in bands roughly parallel to the channel. Thus, low ridges known as natural levees were formed. On these ridges, Dubbs, Keo, and Rilla soils formed. Finer sediment, high in silt, was deposited as floodwater spread and lost velocity. This sediment also contained some sand and clay. Soils such as Hebert and Commerce formed here. When the flood receded and water was left standing as shallow lakes or swamps, the clay and finer silt settled. The Perry, Portland, and Kobel soils formed in this sediment.

In the northeastern and central parts of Lonoke County and the western two-thirds of Prairie County, the parent material is loess that was deposited during the Pleistocene epoch. This mantle of wind-transported material was deposited over older alluvium. On the uplands, the mantle is thick enough so that the solum of most soils, such as Loring, formed entirely in loess. Generally, the loess ranges from about 6 to 12 feet or more in thickness in the upland area. On the level to nearly level plains area, the loess ranges from about 1 to 8 feet or more in thickness. The Calhoun, Calloway, Crowley, and Stuttgart soils formed mainly in this area.

The coastal plain sediments, in the north central part of Lonoke County, were deposited when the Gulf of Mexico covered southern and eastern Arkansas. These sediments are mainly loamy and clayey. Amy, Sacul, Sawyer, and Smithdale are the dominant soils which formed in these sediments.

The parent material in the extreme northwestern part of Lonoke county consists of interbedded sandstone and shale. Faulting and folding of parent material has occurred. Linker and Mountainburg soils formed in residuum of sandstone. The clayey Enders soil formed in residuum of shale. Leadvale and Taft soils formed in the valleys where the sediment that washed from the adjacent uplands was the dominant parent material.

relief

Relief is the inequalities in elevation of a land surface considered collectively. Relief influences the other soil forming factors through its effect on drainage, runoff, erosion, and percolation of water through the soil. Some of the greatest differences among the soils are due mainly to differences in relief.

time

The length of time required for soil formation depends largely on other factors of soil formation. Less time generally is required if the climate is warm and humid and the vegetation luxuriant. If other factors are equal, less time is also required if the parent material is loamy than if it is clayey.

In terms of geological time, most of the soils of Lonoke and Prairie Counties are young, except for a small area in the northwestern part of Lonoke County. In terms of soil formation, their age varies widely. Older soils usually show a greater contrast between horizons than do younger ones.

All the soils in Lonoke and Prairie Counties have a developed B horizon. Some soils such as Oaklimeter and Commerce soils have not been in place long enough to form an argillic, or mature B horizon, but have formed a cambic, or less well developed, B horizon. Others, such as Perry, Portland, and Kobel soils, formed in slackwater deposits of clays that shrink and swell. Because of the high clay content and because of mixing caused by shrinking and swelling, an argillic horizon has not formed. Many soils, such as Hebert, Rilla, Crowley, Calhoun, and Muskogee soils, have been forming long enough and in stable enough material to have an argillic horizon. Others, such as Loring and Calloway, also have a fragipan.

Generally, the soils on the Coastal Plain Uplands and Arkansas Valley Uplands have been forming longer than other soils in the survey area. These soils have the most strongly developed argillic horizon and are the most mature soils in the survey area. Sawyer and Sacul soils formed on the Coastal Plain Uplands. Ender, Linker, Mountainburg, and Leadvale soils formed on the Arkansas Valley Uplands.

processes of soil formation

In this subsection a brief definition of the horizon nomenclature and processes responsible for soil formation are given.

The marks that the soil-forming factors leave on the soil are recorded in the soil profile, which is a succession of layers, or horizons, from the surface to the parent rock. The horizons differ from one another in one or more properties such as color, texture, structure, consistency, and porosity.

Most soil profiles contain three major horizons called A, B, and C. Very young soils do not have a B horizon.

The first, or A horizon, is the horizon of maximum accumulation of organic matter. As such, it is called the A1 horizon or the surface layer. Or, it is the horizon of maximum leaching of dissolved or suspended materials, in which case it is called the A2 horizon or subsurface layer.

The B horizon is immediately below the A horizon and is sometimes called the subsoil (*9*). It is a horizon of maximum accumulation of suspended materials such as clay and iron. The B horizon commonly has blocky structure and is firmer than the horizons immediately above and below it.

Beneath the B horizon is the C horizon. It has been little affected by the soil-forming processes, but the C horizon can be materially modified by weathering. In some young soils, the C horizon immediately underlies the A horizon and has been slightly modified by living organisms as well as by weathering.

Several processes have been active in the formation of soil horizons in Lonoke and Prairie Counties. Among these processes are: (1) the accumulation of organic matter, (2) the leaching of bases, (3) the oxidation or reduction and transfer of iron, and (4) the formation and translocation of silicate clay minerals. In most of the soils of the county, more than one of these processes has been active in soil formation.

Accumulation of organic matter in the upper part of the profile to form an A1 horizon has been an important process of soil formation. The soils of Lonoke and Prairie Counties range from high to low in organic matter content.

Leaching of bases has occurred to some degree in nearly all of the soils of Lonoke and Prairie Counties. Among soil scientists it is generally accepted that bases are leached downward in soils before silicate clay minerals begin to move. Most of the soils in the survey area are moderately leached, an important factor in horizon development. Some soils, such as Commerce and Kobel, are only slightly leached. Others, such as Enders, Linker, and Mountainburg, are strongly leached.

Oxidation of iron is evident in the moderately well drained and well drained soils in the county. Oxidation of iron is indicated by the red and brown colors in the B horizon of Linker, Mountainburg, and Enders soils on uplands and Leadvale and Loring soils in valleys.

Reduction and transfer of iron has occurred to a significant degree in the poorly drained and somewhat poorly drained soils of the lowlands. In the naturally wet soils, this process is called gleying. Gray colors in the horizons below the surface indicate the reduction and loss of iron. Some horizons contain reddish or yellowish mottles and concretions derived from segregated iron. Gleying is very pronounced in the Calhoun, Crowley, and Tichnor soils.

Translocation of silicate clay minerals has contributed to horizon development in most of the soils in the county. In cultivated areas, most of the eluviated A2 horizon has been destroyed. Where it occurs, the structure is usually weak subangular blocky, the clay content is less than in the lower horizons, and the horizon is lighter in color. Clay films generally have accumulated in pores and on the surface of peds in the B horizon. The soils were probably leached of carbonates and soluble salts to a great extent before translocation of silicate clay occurred, even though the content of bases is still high in some of the soils on lowlands.

Leaching of bases and translocation of silicate clay are among the most important processes in horizon differentiation in the soils of Lonoke and Prairie Counties.

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glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

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.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

Chiseling. Tillage with an implement having one or more soil-penetrating points that loosen the subsoil and bring clods to the surface. A form of emergency tillage to control soil blowing.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15.2 to 38.1 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

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.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of 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.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, and clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Fragile (in tables). A soil that is easily damaged by use or disturbance.

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.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

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.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 centimeters) in diameter.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual.* The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

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.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

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.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Sandy loam and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely 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.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

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.

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.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer 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.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

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 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A 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.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in 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.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron are in soils in extremely small amounts. They are essential to plant growth.

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.

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.--ACREAGE OF PRINCIPAL CROPS AND PASTURE IN 1969 and 1974

Crops	Lonoke County		Prairie County	
	1969	1974	1969	1974
Soybeans (for beans)	180,553	138,905	175,523	165,801
Cotton	42,362	46,286	5,809	3,692
Other small grain (includes rice)	53,623	59,879	60,271	61,101
Wheat	685	2,326	1,216	1,221
Oats	4,936	1,656	11,220	6,022
Corn (for all purposes)	836	261	505	192
Sorghum (for all purposes)	1,584	1,911	668	1,845
Hay	11,180	13,644	3,911	4,096
Pasture and range	15,579	35,549	6,626	13,293

TABLE 2.--NUMBER OF LIVESTOCK AND POULTRY IN 1969 AND 1974

Livestock	Lonoke County		Prairie County	
	1969	1974	1969	1974
All cattle and calves	27,658	36,250	8,321	10,820
Milk cows	5,242	5,140	1,200	1,027
Hogs and pigs	890	3,335	863	521
Chickens*	212,950	428,856	23,534	18,628

* More than 3 months old.

TABLE 3.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1951-78 at Searcy, Arkansas]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days[1]	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January-----	50.1	28.8	39.5	75	5	27	4.12	1.88	6.03	6	2.1
February---	55.2	32.6	43.9	77	11	47	3.78	2.00	5.33	6	1.2
March-------	63.6	39.9	51.7	85	18	177	5.59	2.90	7.94	8	.4
April-------	74.7	50.2	62.5	89	31	375	4.80	2.43	6.86	7	.0
May---------	82.3	58.2	70.2	94	40	626	5.34	2.72	7.62	7	.0
June--------	89.7	65.7	77.7	100	50	831	3.80	1.77	5.59	6	.0
July--------	93.4	69.5	81.5	103	57	977	3.97	1.77	5.83	6	.0
August------	92.4	67.6	80.0	104	54	930	3.97	1.58	5.98	5	.0
September--	85.8	61.4	73.6	99	43	708	4.19	1.43	6.46	5	.0
October-----	76.3	48.9	62.6	92	29	396	2.67	.92	4.12	4	.0
November---	62.8	39.1	51.0	82	17	107	4.63	2.11	6.77	6	.2
December---	52.9	32.2	42.6	75	9	27	4.53	2.49	6.33	7	.4
Yearly:											
Average--	73.3	49.5	61.4	---	---	---	---	---	---	---	---
Extreme--	---	---	---	105	2	---	---	---	---	---	---
Total----	---	---	---	---	---	5,228	51.39	43.09	59.32	73	4.3

[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 4.--FREEZE DATES IN SPRING AND FALL

[Recorded in the period 1951-78 at Searcy, Arkansas]

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	March 25	April 3	April 14
2 years in 10 later than--	March 18	March 28	April 9
5 years in 10 later than--	March 4	March 17	March 31
First freezing temperature in fall:			
1 year in 10 earlier than--	November 2	October 28	October 18
2 years in 10 earlier than--	November 8	November 1	October 22
5 years in 10 earlier than--	November 19	November 9	October 30

TABLE 5.--GROWING SEASON

[Recorded in the period 1951-78 at Searcy, Arkansas]

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	233	216	194
8 years in 10	242	223	200
5 years in 10	260	237	212
2 years in 10	277	250	224
1 year in 10	287	257	231

TABLE 6.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Lonoke County	Prairie County	Total-- Area	Extent
		Acres	Acres	Acres	Pct
1	Amy silt loam, frequently flooded	18,159	0	18,159	1.9
2	Calhoun silt loam, 0 to 1 percent slopes	32,416	55,238	87,654	9.2
3	Calloway silt loam, 0 to 1 percent slopes	31,152	42,605	73,757	7.8
4	Caspiana silt loam, 0 to 1 percent slopes	11,806	0	11,806	1.2
5	Commerce silt loam, 0 to 1 percent slopes	0	8,190	8,190	0.9
6	Commerce silt loam, frequently flooded	0	13,524	13,524	1.4
7	Crowley silt loam, 0 to 1 percent slopes	19,696	62,083	81,779	8.6
8	Dubbs silt loam, 0 to 1 percent slopes	0	1,503	1,503	0.2
9	Dubbs silt loam, 1 to 3 percent slopes	0	6,663	6,663	0.7
10	Enders stony fine sandy loam, 8 to 15 percent slopes	5,246	0	5,246	0.6
11	Hebert silt loam, 0 to 1 percent slopes	63,597	0	63,597	6.7
12	Jackport silty clay loam, 0 to 1 percent slopes	0	3,878	3,878	0.4
13	Jackport silty clay loam, 1 to 3 percent slopes	0	1,935	1,935	0.2
14	Keo silt loam, 0 to 1 percent slopes	5,272	0	5,272	0.6
15	Keo silt loam, 1 to 3 percent slopes	4,391	0	4,391	0.5
16	Kobel silty clay loam, 0 to 1 percent slopes	0	13,034	13,034	1.4
17	Kobel silty clay loam, frequently flooded	0	32,699	32,699	3.5
18	Leadvale silt loam, 1 to 3 percent slopes	11,104	0	11,104	1.2
19	Leadvale silt loam, 3 to 8 percent slopes	13,527	0	13,527	1.4
20	Linker-Enders-Mountainburg complex, 12 to 25 percent slopes	4,411	0	4,411	0.5
21	Loring silt loam, 1 to 3 percent slopes	45,402	33,072	78,474	8.3
22	Loring silt loam, 3 to 8 percent slopes	17,492	38,478	55,970	5.9
23	Loring-McKamie complex, 8 to 20 percent slopes	2,022	12,420	14,442	1.5
24	Moreland silty clay, 0 to 1 percent slopes	4,286	0	4,286	0.5
25	Muskogee silt loam, 3 to 8 percent slopes	5,705	14,764	20,469	2.1
26	Oaklimeter silt loam, occasionally flooded	8,615	7,362	15,977	1.7
27	Perry silty clay, 0 to 1 percent slopes	68,138	937	69,075	7.3
28	Perry silty clay, frequently flooded	13,120	6,094	19,214	2.0
29	Portland silty clay, 0 to 1 percent slopes	18,577	0	18,577	1.9
30	Rilla silt loam, 0 to 1 percent slopes	9,223	0	9,223	1.0
31	Rilla silt loam, 1 to 3 percent slopes	11,159	0	11,159	1.2
32	Sacul fine sandy loam, 3 to 8 percent slopes	4,513	0	4,513	0.5
33	Sawyer silt loam, 3 to 8 percent slopes	12,304	0	12,304	1.3
34	Smithdale sandy loam, 5 to 8 percent slopes	879	0	879	0.1
35	Stuttgart silt loam, 0 to 1 percent slopes	16,250	24,152	40,402	4.2
36	Stuttgart silt loam, 1 to 3 percent slopes	7,021	10,363	17,384	1.8
37	Taft silt loam, 0 to 2 percent slopes	6,919	0	6,919	0.7
38	Tichnor silt loam, frequently flooded	17,506	20,910	38,416	4.0
39	Yorktown silty clay	1,834	0	1,834	0.2
	Small water areas[1]	17,634	12,944	30,578	3.2
	Large water areas[2]	3,264	12,992	16,256	1.7
	Total	512,640	435,840	948,480	100.0

[1] Enclosed areas of water less than 40 acres in size, and streams, sloughs, and canals less than one-eighth of a statute mile in width.

[2] Enclosed areas of water more than 40 acres in size, and streams, sloughs, and canals more than one-eighth of a statute mile in width.

TABLE 7.--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	Soybeans	Rice	Wheat	Cotton lint	Tall fescue	Improved bermuda-grass	Bahiagrass
	Bu	Bu	Bu	Lb	AUM*	AUM*	AUM*
1 Amy	---	---	---	---	4.0	---	5.5
2 Calhoun	30	120	---	---	7.0	---	6.5
3 Calloway	35	120	35	650	8.0	9.0	8.0
4 Caspiana	40	---	40	875	9.0	12.0	9.0
5 Commerce	40	---	40	900	9.0	12.0	9.0
6 Commerce	30	---	---	---	7.0	---	7.0
7 Crowley	30	130	---	---	7.0	---	7.0
8 Dubbs	40	---	40	850	9.0	12.0	9.0
9 Dubbs	35	---	35	800	9.0	12.0	9.0
10 Enders	---	---	---	---	4.0	---	4.0
11 Hebert	35	---	35	775	8.0	11.0	8.0
12 Jackport	35	130	---	550	8.0	---	---
13 Jackport	25	---	---	---	---	---	---
14 Keo	40	---	40	800	9.0	12.0	9.0
15 Keo	40	---	40	800	9.0	12.0	9.0
16 Kobel	35	130	---	550	7.0	9.0	7.0
17 Kobel	30	---	---	---	6.0	7.0	6.0
18 Leadvale	30	---	40	---	8.5	10.0	8.5
19 Leadvale	25	---	35	---	8.0	9.0	8.0
20 Linker-Enders-Mountainburg	---	---	---	---	---	---	---
21 Loring	30	---	40	---	8.5	10.0	8.5
22 Loring	25	---	35	---	8.0	9.0	8.0

See footnote at end of table.

TABLE 7.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Soybeans	Rice	Wheat	Cotton lint	Tall fescue	Improved bermuda-grass	Bahiagrass
	Bu	Bu	Bu	Lb	AUM*	AUM*	AUM*
23 Loring-McKamie	---	---	---	---	6.0	7.5	6.0
24 Moreland	35	130	---	625	7.5	9.0	7.5
25 Muskogee	25	---	30	---	7.5	9.0	7.5
26 Oaklimeter	30	---	---	750	9.0	10.0	9.0
27 Perry	35	130	---	425	7.5	9.0	7.5
28 Perry	30	---	---	---	6.0	8.0	6.0
29 Portland	35	130	---	600	7.5	9.0	7.5
30 Rilla	40	---	40	900	9.0	12.0	9.0
31 Rilla	35	---	40	850	9.0	12.0	9.0
32 Sacul	---	---	---	---	7.5	9.0	7.5
33 Sawyer	20	---	30	---	7.5	9.0	7.5
34 Smithdale	---	---	---	---	8.0	9.0	8.0
35 Stuttgart	35	130	35	---	8.0	9.0	8.0
36 Stuttgart	30	115	35	---	8.0	9.0	8.0
37 Taft	30	---	30	---	7.0	---	7.0
38 Tichnor	30	---	---	---	6.0	---	6.0
39 Yorktown	---	---	---	---	---	---	---

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY

Soil name and map symbol	Woodland suitability group	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Potential productivity: Common trees	Potential productivity: Site index	Trees to plant
1 Amy	2w9	Slight	Severe	Severe	Loblolly pine	90	Loblolly pine, sweetgum, eastern cottonwood, green ash, American sycamore, Nuttall oak.
					Sweetgum	90	
					Water oak	90	
2 Calhoun	3w9	Slight	Severe	Moderate	Loblolly pine	84	Loblolly pine, cherrybark oak, sweetgum.
					Shortleaf pine	---	
					Sweetgum	---	
					Cherrybark oak	---	
					Water oak		
3 Calloway	2w8	Slight	Moderate	Slight	Cherrybark oak	90	Cherrybark oak, loblolly pine, water oak.
					Loblolly pine	90	
					Sweetgum	90	
					Water oak	90	
4 Caspiana	2o4	Slight	Slight	Slight	Green ash	75	Eastern cottonwood, sweetgum, American sycamore.
					Eastern cottonwood	105	
					Cherrybark oak	100	
					Pecan	---	
					Sweetgum	100	
					American sycamore	---	
5, 6 Commerce	1w5	Slight	Moderate	Slight	Green ash	80	Eastern cottonwood, American sycamore, water oak, pecan.
					Eastern cottonwood	120	
					Nuttall oak	90	
					Water oak	110	
					Pecan	---	
					American sycamore	---	
7 Crowley	3w9	Slight	Severe	Moderate	Loblolly pine	83	Loblolly pine.
					Shortleaf pine	---	
					Water oak	---	
					Sweetgum	---	
8, 9 Dubbs	2o4	Slight	Slight	Slight	Cherrybark oak	100	Eastern cottonwood, green ash, Nuttall oak, sweetgum, American sycamore.
					Eastern cottonwood	100	
					Green ash	80	
					Nuttall oak	95	
					Shumard oak	100	
					Sweetgum	95	
					Water oak	90	
					Willow oak	95	
10 Enders	4x2	Slight	Moderate	Slight	Southern red oak	60	Loblolly pine, shortleaf pine, eastern redcedar.
					White oak	55	
					Eastern redcedar	40	
					Shortleaf pine	60	
11 Hebert	2w5	Slight	Moderate	Slight	Green ash	---	Eastern cottonwood, American sycamore, water oak.
					Eastern cottonwood	95	
					Cherrybark oak	95	
					Nuttall oak	90	
					Sweetgum	90	
					Pecan	---	
					Water oak	90	
					American sycamore	---	
12, 13 Jackport	2w6	Slight	Severe	Moderate	Green ash	80	Green ash, eastern cottonwood, Nuttall oak, willow oak, sweetgum, American sycamore.
					Cherrybark oak	90	
					Water oak	90	
					Willow oak	90	
					Sweetgum	90	

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Wood-land suita-bility group	Management concerns			Potential productivity		Trees to plant
		Erosion hazard	Equip-ment limita-tion	Seedling mortal-ity	Common trees	Site index	
14, 15 Keo	2o4	Slight	Slight	Slight	Eastern cottonwood American sycamore Sweetgum Southern red oak Water oak Black walnut Green ash	100 --- --- --- --- --- 	Eastern cottonwood, American sycamore, sweetgum, black walnut, Shumard oak.
16 Kobel	2w6	Slight	Severe	Moderate	Green ash Eastern cottonwood Cherrybark oak Sweetgum Water oak Pecan American sycamore	85 100 90 90 90 --- ---	Eastern cottonwood, American sycamore, sweetgum.
17 Kobel	3w6	Slight	Severe	Severe	Green ash Eastern cottonwood Water oak Water hickory	75 90 80 ---	Eastern cottonwood, sweetgum.
18, 19 Leadvale	3o7	Slight	Slight	Slight	Loblolly pine Shortleaf pine Southern red oak	74 64 80	Loblolly pine, shortleaf pine, southern red oak, black walnut.
20*:							
Linker	4x2	Slight	Moderate	Slight	Shortleaf pine Southern red oak White oak Eastern redcedar Loblolly pine	60 50 50 40 ---	Shortleaf pine, loblolly pine, eastern redcedar.
Enders	4x2	Slight	Moderate	Slight	Southern red oak White oak Eastern redcedar Shortleaf pine	60 55 40 60	Loblolly pine, shortleaf pine, eastern redcedar.
Mountainburg	5x3	Moderate	Severe	Moderate	Shortleaf pine Eastern redcedar Loblolly pine	50 30 ---	Shortleaf pine, eastern redcedar, loblolly pine.
21, 22 Loring	3o7	Slight	Slight	Slight	Southern red oak Loblolly pine Sweetgum Cherrybark oak	75 85 --- 85	Southern red oak, loblolly pine.
23*							
Loring	3o7	Slight	Slight	Slight	Southern red oak Loblolly pine Sweetgum Cherrybark oak	75 85 --- 85	Southern red oak, loblolly pine.
McKamie	3c2	Slight	Moderate	Moderate	Loblolly pine Shortleaf pine	80 70	Loblolly pine, shortleaf pine.
24 Moreland	2w6	Slight	Severe	Moderate	Green ash Eastern cottonwood Sweetgum American sycamore Water oak	75 100 90 --- 90	Eastern cottonwood, American sycamore, water oak.
25 Muskogee	3o7	Slight	Slight	Slight	Shortleaf pine Sweetgum Loblolly pine Water oak Southern red oak	70 80 --- --- ---	Loblolly pine, shortleaf pine, eastern redcedar, Shumard oak, water oak, sweetgum.

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Woodland suitability group	Management concerns			Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	
26----------------- Oaklimeter	1o7	Slight	Slight	Slight	Cherrybark oak--------- Eastern cottonwood----- Loblolly pine---------- Nuttall oak------------ Willow oak------------- Sweetgum----------------	100 100 90 100 100 100	Cherrybark oak, eastern cottonwood, Nuttall oak, sweetgum, water oak.
27----------------- Perry	2w6	Slight	Severe	Moderate	Eastern cottonwood----- Green ash-------------- Sweetgum---------------- Water oak-------------- Water hickory----------	90 72 92 --- ---	Eastern cottonwood, sweetgum, water oak.
28----------------- Perry	3w6	Slight	Severe	Severe	Eastern cottonwood----- Green ash-------------- Sweetgum---------------- Water oak-------------- Water hickory----------	90 72 92 --- ---	Eastern cottonwood, sweetgum, water oak.
29----------------- Portland	2w6	Slight	Severe	Moderate	Green ash-------------- Eastern cottonwood----- Sweetgum----------------	80 100 90	Green ash, eastern cottonwood, sweetgum.
30, 31------------- Rilla	2o4	Slight	Slight	Slight	Eastern cottonwood----- Cherrybark oak--------- Nuttall oak------------ Sweetgum---------------- Pecan------------------- American sycamore------	100 100 85 100 --- ---	Eastern cottonwood, American sycamore, Nuttall oak.
32----------------- Sacul	3c2	Moderate	Slight	Slight	Loblolly pine---------- Shortleaf pine---------	80 70	Loblolly pine, shortleaf pine.
33----------------- Sawyer	2w2	Slight	Moderate	Slight	Loblolly pine---------- Shortleaf pine--------- Sweetgum----------------	90 80 90	Loblolly pine, shortleaf pine.
34----------------- Smithdale	3o1	Slight	Slight	Slight	Loblolly pine---------- Shortleaf pine---------	80 69	Loblolly pine.
35----------------- Stuttgart	3w8	Slight	Moderate	Slight	Loblolly pine---------- Shortleaf pine--------- Cherrybark oak--------- Sweetgum----------------	80 70 70 80	Loblolly pine, cherrybark oak, Shumard oak, sweetgum, willow oak, southern red oak.
36----------------- Stuttgart	3o7	Slight	Slight	Slight	Loblolly pine---------- Shortleaf pine--------- Cherrybark oak--------- Sweetgum----------------	80 70 70 80	Loblolly pine, cherrybark oak, Shumard oak, sweetgum, willow oak, southern red oak.
37----------------- Taft	3w8	Slight	Moderate	Moderate	Loblolly pine---------- Sweetgum---------------- Shortleaf pine--------- Water oak--------------	85 80 60 65	Loblolly pine, sweetgum, water oak.
38----------------- Tichnor	1w6	Slight	Severe	Moderate	Eastern cottonwood----- Nuttall oak------------ Cherrybark oak--------- Sweetgum----------------	105 100 90 100	Eastern cottonwood, Nuttall oak, cherrybark oak, sweetgum, American sycamore, green ash, water oak.
39----------------- Yorktown	4w6	Slight	Severe	Severe	Baldcypress------------ Water tupelo----------- Water hickory----------	--- --- ---	Baldcypress, water tupelo.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe"]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
1 Amy	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.
2 Calhoun	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
3 Calloway	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.
4 Caspiana	Slight	Slight	Slight	Slight.
5 Commerce	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.
6 Commerce	Severe: flooding.	Moderate: wetness, percs slowly, flooding.	Severe: flooding.	Moderate: flooding, wetness.
7 Crowley	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.
8 Dubbs	Slight	Slight	Slight	Slight.
9 Dubbs	Slight	Slight	Moderate: slope.	Slight.
10 Enders	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, small stones, percs slowly.	Severe: erodes easily.
11 Hebert	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetmess.
12, 13 Jackport	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.
14 Keo	Slight	Slight	Slight	Slight.
15 Keo	Slight	Slight	Moderate: slope.	Slight.
16 Kobel	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.
17 Kobel	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, flooding.	Severe: wetness.
18, 19 Leadvale	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
20*:				
Linker	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: large stones, slope.
Enders	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, small stones, percs slowly.	Severe: erodes easily.
Mountainburg	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: large stones.
21, 22 Loring	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight.
23*:				
Loring	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.
McKamie	Moderate: percs slowly, slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.
24 Moreland	Severe: wetness, percs slowly.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey, wetness, percs slowly.	Severe: wetness, too clayey.
25 Muskogee	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.
26 Oaklimeter	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Moderate: wetness.
27 Perry	Severe: wetness, percs slowly.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey, wetness, flooding.	Severe: wetness, too clayey.
28 Perry	Severe: flooding, wetness, percs slowly.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey, wetness.	Severe: wetness, too clayey.
29 Portland	Severe: wetness, percs slowly.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey, wetness.	Severe: wetness, too clayey.
30 Rilla	Slight	Slight	Slight	Slight.
31 Rilla	Slight	Slight	Moderate: slope.	Slight.
32 Sacul	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
33 Sawyer	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight.
34 Smithdale	Slight	Slight	Severe: slope.	Slight.
35, 36 Stuttgart	Severe: wetness, percs slowly, excess sodium.	Severe: excess sodium, percs slowly.	Severe: wetness, percs slowly.	Moderate: wetness.
37 Taft	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.
38 Tichnor	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.
39 Yorktown	Severe: flooding, ponding, percs slowly.	Severe: ponding, too clayey, excess humus.	Severe: too clayey, excess humus, ponding.	Severe: ponding, too clayey, excess humus.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--WILDLIFE HABITAT POTENTIALS

[See text for definitions of "good," "fair," "poor," and "very poor"]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
1 Amy	Poor	Fair	Fair	Good	Fair	Good	Poor	Fair	Good	Fair.
2 Calhoun	Poor	Fair	Fair	Good	---	Good	Good	Fair	Fair	Good.
3 Calloway	Fair	Good	Good	Good	---	Fair	Fair	Good	Good	Fair.
4 Caspiana	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor.
5 Commerce	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair.
6 Commerce	Poor	Fair	Fair	Good	---	Fair	Fair	Fair	Good	Fair.
7 Crowley	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good.
8, 9 Dubbs	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.
10 Enders	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
11 Hebert	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair.
12 Jackport	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good.
13 Jackport	Fair	Fair	Fair	Fair	---	Fair	Poor	Fair	Fair	Fair.
14, 15 Keo	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.
16 Kobel	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good.
17 Kobel	Poor	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good.
18 Leadvale	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
19 Leadvale	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
20*:										
Linker	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Enders	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Mountainburg	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Poor	Very poor.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT POTENTIALS--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
21----------------- Loring	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
22----------------- Loring	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
23*:										
Loring------------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
McKamie-----------	Fair	Good	Good	---	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
24----------------- Moreland	Fair	Fair	Fair	Good	---	Good	Good	Fair	Good	Good.
25----------------- Muskogee	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
26----------------- Oaklimeter	Good	Good	Good	Good	Poor	Poor	Poor	Good	Good	Poor.
27----------------- Perry	Fair	Fair	Fair	Good	---	Good	Good	Fair	Good	Good.
28----------------- Perry	Poor	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good.
29----------------- Portland	Poor	Fair	Fair	Good	---	Good	Good	Fair	Good	Good.
30, 31------------- Rilla	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.
32----------------- Sacul	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
33----------------- Sawyer	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
34----------------- Smithdale	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
35----------------- Stuttgart	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
36----------------- Stuttgart	Good	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
37----------------- Taft	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
38----------------- Tichnor	Poor	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good.
39----------------- Yorktown	Very poor.	Very poor.	Very poor.	Poor	Poor	Poor	Good	Very poor.	Very poor.	Fair.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe"]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
1: Amy	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.
2: Calhoun	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.
3: Calloway	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.
4: Caspiana	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength.
5: Commerce	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength.
6: Commerce	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding.
7: Crowley	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, shrink-swell.
8, 9: Dubbs	Slight	Slight	Slight	Slight	Slight.
10: Enders	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.
11: Hebert	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength.
12, 13: Jackport	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, shrink-swell.
14, 15: Keo	Slight	Slight	Slight	Slight	Slight.
16: Kobel	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, low strength, shrink-swell.
17: Kobel	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, wetness, flooding.
18: Leadvale	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: low strength, wetness.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
19----------------- Leadvale	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: low strength, wetness.
20*:					
Linker-----------	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.
Enders-----------	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.
Mountainburg-----	Severe: depth to rock, large stones, slope.	Severe: slope, depth to rock, large stones.	Severe: depth to rock, slope, large stones.	Severe: slope, depth to rock, large stones.	Severe: depth to rock, slope, large stones.
21----------------- Loring	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.
22----------------- Loring	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: low strength.
23*:					
Loring-----------	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Severe: low strength.
McKamie----------	Severe: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: slope, shrink-swell.	Severe: low strength, shrink-swell.
24----------------- Moreland	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, shrink-swell.
25----------------- Muskogee	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, shrink-swell.
26----------------- Oaklimeter	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.
27----------------- Perry	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, shrink-swell.
28----------------- Perry	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, wetness, flooding.
29----------------- Portland	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, shrink-swell.
30, 31------------ Rilla	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength.
32----------------- Sacul	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
33----------------- Sawyer	Severe: wetness.	Severe: shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
34----------------- Smithdale	Slight-----------	Slight-----------	Slight-----------	Moderate: slope.	Slight.
35, 36------------ Stuttgart	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, shrink-swell.
37----------------- Taft	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.
38----------------- Tichnor	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.
39----------------- Yorktown	Severe: ponding.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: low strength, ponding, flooding.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--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]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
1 Amy	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
2 Calhoun	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
3 Calloway	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
4 Caspiana	Moderate: wetness, percs slowly.	Moderate: seepage, wetness.	Moderate: wetness.	Moderate: wetness.	Fair: too clayey.
5 Commerce	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: thin layer.
6 Commerce	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: thin layer.
7 Crowley	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
8, 9 Dubbs	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Good.
10 Enders	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.
11 Hebert	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
12, 13 Jackport	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
14, 15 Keo	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Slight	Good.
16 Kobel	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
17 Kobel	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
18, 19 Leadvale	Severe: wetness, percs slowly.	Severe: wetness.	Severe: depth to rock.	Moderate: depth to rock, wetness.	Fair: area reclaim, too clayey.

See footnote at end of table.

TABLE 12.--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
20*:					
Linker	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, slope, thin layer.
Enders	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
Mountainburg	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, small stones, slope.
21, 22 Loring	Severe: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Fair: wetness.
23*:					
Loring	Severe: wetness, percs slowly.	Severe: slope, wetness.	Moderate: wetness, slope.	Moderate: wetness, slope.	Fair: slope, wetness.
McKamie	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey.
24 Moreland	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
25 Muskogee	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
26 Oaklimeter	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness, too clayey.
27 Perry	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
28 Perry	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
29 Portland	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
30 Rilla	Moderate: wetness, percs slowly.	Moderate: seepage, wetness.	Moderate: wetness.	Moderate: wetness.	Fair: thin layer.
31 Rilla	Moderate: wetness, percs slowly.	Moderate: seepage, slope, wetness.	Moderate: wetness.	Moderate: wetness.	Fair: thin layer.

See footnote at end of table.

TABLE 12.--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
32------------------ Sacul	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight-----------	Poor: too clayey, hard to pack.
33------------------ Sawyer	Severe: wetness, percs slowly.	Severe: wetness.	Severe: too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
34------------------ Smithdale	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: too clayey.
35, 36-------------- Stuttgart	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, excess sodium.	Severe: wetness.	Poor: wetness, excess sodium.
37------------------ Taft	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
38------------------ Tichnor	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
39------------------ Yorktown	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding, too clayey.	Severe: flooding, ponding.	Poor: too clayey, hard to pack, ponding.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--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"]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
1 Amy	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
2 Calhoun	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
3 Calloway	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
4 Caspiana	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
5, 6 Commerce	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
7 Crowley	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
8, 9 Dubbs	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
10 Enders	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, small stones.
11 Hebert	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
12, 13 Jackport	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
14, 15 Keo	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
16, 17 Kobel	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
18, 19 Leadvale	Fair: area reclaim, low strength, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Good.
20*:				
Linker	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Enders	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, thin layer, small stones.
Mountainburg	Poor: area reclaim, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
21, 22: Loring	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
23*:				
Loring	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
McKamie	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
24: Moreland	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
25: Muskogee	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
26: Oaklimeter	Fair: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
27, 28: Perry	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
29: Portland	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
30, 31: Rilla	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
32: Sacul	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
33: Sawyer	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
34: Smithdale	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
35, 36: Stuttgart	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess sodium.
37: Taft	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
38: Tichnor	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
39: Yorktown	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe"]

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
1----------------- Amy	Moderate: seepage.	Severe: wetness.	Percs slowly, flooding.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, percs slowly.
2----------------- Calhoun	Slight----------	Severe: piping, wetness.	Percs slowly---	Wetness, percs slowly, erodes easily.	Erodes easily, wetness.	Wetness, percs slowly.
3----------------- Calloway	Slight----------	Moderate: piping, wetness.	Percs slowly---	Wetness, percs slowly, rooting depth.	Erodes easily, wetness, rooting depth.	Wetness, rooting depth.
4----------------- Caspiana	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily	Erodes easily	Favorable.
5----------------- Commerce	Moderate: seepage.	Severe: wetness.	Favorable-------	Wetness, erodes easily.	Erodes easily, wetness.	Favorable.
6----------------- Commerce	Moderate: seepage.	Severe: wetness.	Flooding--------	Wetness, erodes easily.	Erodes easily, wetness.	Favorable.
7----------------- Crowley	Slight----------	Severe: wetness.	Percs slowly---	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, percs slowly.
8----------------- Dubbs	Severe: seepage.	Severe: piping.	Deep to water	Erodes easily	Erodes easily	Favorable.
9----------------- Dubbs	Severe: seepage.	Severe: piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
10---------------- Enders	Moderate: depth to rock.	Moderate: hard to pack.	Deep to water	Percs slowly, slope, erodes easily.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
11---------------- Hebert	Moderate: seepage.	Severe: wetness.	Favorable-------	Wetness, erodes easily.	Erodes easily, wetness.	Favorable.
12---------------- Jackport	Slight----------	Severe: hard to pack, wetness.	Percs slowly---	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, percs slowly.
13---------------- Jackport	Slight----------	Severe: hard to pack, wetness.	Percs slowly---	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
14---------------- Keo	Slight----------	Severe: piping.	Deep to water	Erodes easily	Erodes easily	Favorable.
15---------------- Keo	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
16---------------- Kobel	Slight----------	Severe: hard to pack, wetness.	Percs slowly---	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, percs slowly.
17---------------- Kobel	Slight----------	Severe: hard to pack, wetness.	Percs slowly, flooding.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, percs slowly.
18---------------- Leadvale	Moderate: seepage, depth to rock.	Severe: piping.	Percs slowly---	Wetness, percs slowly, rooting depth.	Erodes easily, wetness.	Erodes easily, rooting depth.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
19 Leadvale	Moderate: seepage, depth to rock.	Severe: piping.	Percs slowly, slope.	Wetness, percs slowly, rooting depth.	Erodes easily, wetness.	Erodes easily, rooting depth.
20*:						
Linker	Moderate: seepage, depth to rock.	Severe: piping.	Deep to water	Droughty, depth to rock, slope.	Slope, depth to rock.	Slope, droughty, depth to rock.
Enders	Moderate: depth to rock.	Moderate: hard to pack.	Deep to water	Percs slowly, slope, erodes easily.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
Mountainburg	Severe: depth to rock, seepage.	Severe: large stones, thin layer.	Deep to water	Slope, large stones, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
21 Loring	Moderate: seepage.	Moderate: piping.	Favorable	Wetness, rooting depth.	Erodes easily, wetness.	Erodes easily, rooting depth.
22 Loring	Moderate: seepage.	Moderate: piping.	Slope	Wetness, rooting depth, slope.	Erodes easily, wetness.	Erodes easily, rooting depth.
23*:						
Loring	Moderate: seepage.	Moderate: piping.	Slope	Wetness, rooting depth, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
McKamie	Slight	Moderate: shrink-swell, compressible.	Slope	Slope, erodes easily, slow intake.	Slope, erodes easily, percs slowly.	Slope. erodes easily.
24 Moreland	Moderate: seepage.	Severe: hard to pack, wetness.	Percs slowly	Wetness, slow intake, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
25 Muskogee	Slight	Moderate: hard to pack, wetness.	Percs slowly, slope.	Wetness, percs slowly, slope.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
26 Oaklimeter	Moderate: seepage.	Severe: piping, wetness.	Flooding	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Erodes easily.
27 Perry	Slight	Severe: hard to pack, wetness.	Percs slowly	Wetness, slow intake, percs slowly.	Wetness, percs slowly.	Wetness, rooting depth, percs slowly.
28 Perry	Slight	Severe: hard to pack, wetness.	Percs slowly, flooding.	Wetness, slow intake, percs slowly.	Wetness, percs slowly.	Wetness, rooting depth, percs slowly.
29 Portland	Moderate: seepage.	Severe: hard to pack, wetness.	Percs slowly	Wetness, slow intake, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
30 Rilla	Moderate: seepage.	Moderate: piping.	Deep to water	Erodes easily	Erodes easily	Favorable.
31 Rilla	Moderate: seepage.	Moderate: piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
32 Sacul	Slight	Severe: hard to pack.	Percs slowly, slope.	Percs slowly, slope.	Percs slowly	Percs slowly.
33 Sawyer	Slight	Severe: hard to pack.	Percs slowly, slope.	Wetness, percs slowly, slope.	Erodes easily, wetness, percs slowly.	Erodes easily, percs slowly.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
34------------------- Smithdale	Severe: seepage.	Severe: piping.	Deep to water	Slope------------	Favorable-------	Favorable.
35, 36-------------- Stuttgart	Slight----------	Severe: piping, excess sodium.	Percs slowly, excess sodium.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, excess sodium, erodes easily.*
37------------------- Taft	Slight----------	Severe: piping.	Percs slowly---	Wetness, percs slowly, rooting depth.	Erodes easily, wetness, rooting depth.	Wetness, erodes easily, rooting depth.
38------------------- Tichnor	Slight----------	Severe: piping, wetness.	Percs slowly, flooding.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness.	Wetness, percs slowly.
39------------------- Yorktown	Slight----------	Severe: hard to pack, ponding.	Ponding, percs slowly, flooding.	Ponding, slow intake, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
1----------------Amy	0-19	Silt loam--------	ML, CL-ML	A-4	0	100	95-100	90-100	70-95	<30	NP-5
	19-66	Silt loam, silty clay loam.	CL	A-4, A-6	0	100	95-100	95-100	85-95	25-40	8-20
	66-72	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
2----------------Calhoun	0-18	Silt loam--------	CL-ML, ML, CL	A-4	0	100	100	100	95-100	<31	NP-10
	18-72	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	95-100	30-45	11-24
3----------------Calloway	0-26	Silt loam--------	CL-ML, CL	A-4, A-6	0	100	100	100	90-100	25-35	5-15
	26-60	Silt loam, silty clay loam.	CL	A-6	0	100	100	100	90-95	30-40	12-20
	60-72	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	100	100	100	90-100	25-35	5-15
4----------------Caspiana	0-11	Silt loam--------	CL-ML, ML	A-4	0	100	100	100	85-100	<27	NP-7
	11-36	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-7	0	100	100	100	85-100	23-43	4-20
	36-72	Silt loam, very fine sandy loam, silty clay loam.	CL-ML, CL	A-4 A-4, A-6	0	100	100	100	80-100	23-37	4-15
5----------------Commerce	0-5	Silt loam--------	CL-ML, CL, ML	A-4	0	100	100	100	75-100	<30	NP-10
	5-72	Silty clay loam, silt loam, loam.	CL	A-6, A-7	0	100	100	100	85-100	32-45	11-23
6----------------Commerce	0-5	Silt loam--------	CL-ML, CL, ML	A-4	0	100	100	100	75-100	<30	NP-10
	5-72	Silty clay loam, silt loam, loam.	CL	A-6, A-7	0	100	100	100	85-100	32-45	11-23
7----------------Crowley	0-22	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	95-100	80-100	<30	NP-10
	22-53	Silty clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	85-100	41-60	20-35
	53-72	Silty clay loam, silty clay.	CL, CH	A-7, A-6	0	100	100	95-100	85-100	38-60	18-35
8, 9-------------Dubbs	0-12	Silt loam--------	ML, CL-ML, CL	A-4	0	100	100	100	60-90	20-35	3-10
	12-38	Silty clay loam, silt loam, loam.	CL	A-6, A-7	0	100	100	100	85-100	35-50	15-25
	38-52	Loam, silt loam, very fine sandy loam.	ML, CL-ML, CL	A-4, A-6	0	100	100	85-95	55-90	20-35	3-14
	52-72	Loamy fine sand, fine sandy loam.	SM	A-2, A-4	0	100	100	75-95	25-45	<20	NP-3
10---------------Enders	0-3	Stony fine sandy loam.	SM, ML, SM-SC, CL-ML	A-4, A-2	20-40	80-90	70-80	65-75	30-60	20-35	2-10
	3-8	Stony loam, stony silt loam.	SM, ML, SM-SC, CL-ML	A-4	20-40	80-90	70-80	65-75	40-60	20-35	2-10
	8-42	Silty clay, clay	CH	A-7	0	95-100	85-100	85-100	70-95	50-65	30-40
	42-52	Silty clay, shaly silty clay.	CH	A-7	0-15	60-95	60-95	55-95	50-95	50-65	30-40
	52-62	Weathered bedrock, unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag-ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct					Pct	
11------------ Hebert	0-14	Silt loam--------	ML, CL-ML	A-4	0	100	100	100	65-100	<27	NP-7
	14-36	Loam, silt loam, silty clay loam.	CL	A-6, A-7	0	100	100	100	85-100	31-45	11-22
	36-72	Very fine sandy loam, silty clay loam, silt loam.	ML, CL-ML, CL	A-4, A-6	0	100	100	90-100	60-100	22-40	3-18
12, 13----------- Jackport	0-4	Silty clay loam	CL, CH	A-6, A-7	0	100	100	95-100	85-100	30-55	12-30
	4-10	Silty clay, clay	CH	A-7	0	100	100	95-100	90-100	51-85	25-55
	10-36	Clay--------------	CH	A-7	0	100	100	95-100	90-100	65-85	35-55
	36-55	Clay, silty clay, silty clay loam.	CH	A-7	0	100	100	95-100	90-100	51-85	25-55
	55-72	Silty clay, silty clay loam, silt loam.	CH, CL	A-7	0	100	100	95-100	90-100	45-75	20-45
14, 15----------- Keo	0-30	Silt loam--------	ML, CL-ML	A-4	0	100	100	95-100	80-95	<30	NP-7
	30-72	Silt loam, fine sandy loam, very fine sandy loam.	ML, CL, SM, CL-ML	A-4, A-6, A-2	0	100	100	70-100	25-95	<40	NP-15
16, 17----------- Kobel	0-4	Silty clay loam	CL, CH	A-7	0	100	100	95-100	85-95	45-55	25-35
	4-56	Clay, silty clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	90-95	45-75	25-50
	56-72	Sandy clay, silty clay, silty clay loam.	CH, CL	A-7	0	100	100	85-95	60-75	45-70	25-45
18, 19----------- Leadvale	0-6	Silt loam--------	ML, CL-ML, CL	A-4	0	100	95-100	85-95	65-85	18-32	2-10
	6-11	Silt loam, silty clay loam.	CL-ML, CL, ML	A-4, A-6	0	100	95-100	90-98	75-90	22-36	3-14
	11-28	Silt loam, silty clay loam.	CL-ML, CL, ML	A-4, A-6, A-7	0	100	95-100	80-98	70-90	23-42	3-18
	28-72	Silty clay loam, silty clay, silt loam.	CL, MH, ML	A-6, A-7	0-5	90-100	90-100	85-95	70-90	32-58	12-26
20*: Linker----------	0-4	Stony fine sandy loam.	SM, ML, CL-ML	A-4	5-30	80-100	70-95	55-80	40-60	<30	NP-7
	4-38	Fine sandy loam, sandy clay loam, loam.	CL, SC, SM, ML	A-4, A-6	0-10	90-100	80-100	70-100	40-80	<40	NP-18
	38-40	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Enders----------	0-3	Stony fine sandy loam.	SM, ML, SM-SC,	A-4, A-2	20-40	80-90	70-80	65-75	30-60	20-35	2-10
	3-8	Stony loam, stony silt loam.	SM, ML, SM-SC, CL-ML	A-4	20-40	80-90	70-80	65-75	40-60	20-35	2-10
	8-42	Silty clay, clay	CH	A-7	0	95-100	85-100	85-100	70-95	50-65	30-40
	42-52	Silty clay, shaly silty clay.	CH	A-7	0-15	50-95	50-95	40-95	40-95	50-65	30-40
	52-72	Weathered bedrock, unweathered bedrock.	---	---	---	---	---	---	---	---	---
Mountainburg----	0-9	Stony fine sandy loam.	GM	A-1, A-2	30-60	40-50	30-50	20-40	15-25	<20	NP
	9-18	Very gravelly sandy clay loam, very gravelly loam, very gravelly sandy loam.	GM, GC, GM-GC	A-1, A-2	15-60	40-60	30-50	25-50	20-30	<30	NP-10
	18-20	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--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	
21, 22. Loring	0-5	Silt loam	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	<35	NP-15
	5-26	Silt loam, silty clay loam.	CL, ML	A-6, A-7, A-4	0	100	100	95-100	90-100	32-48	8-20
	26-58	Silt loam, silty clay loam.	CL, ML	A-4, A-6, A-7	0	100	100	95-100	90-100	30-45	8-22
	58-72	Silt loam	CL, CL-ML	A-4, A-6, A-7	0	100	100	95-100	70-100	28-45	7-20
23*:											
Loring	0-5	Silt loam	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	<35	NP-15
	5-26	Silt loam, silty clay loam.	CL, ML	A-6, A-7, A-4	0	100	100	95-100	90-100	32-48	8-20
	26-58	Silt loam, silty clay loam.	CL, ML	A-4, A-6, A-7	0	100	100	95-100	90-100	30-45	8-22
	58-72	Silt loam	CL, CL-ML	A-4, A-6, A-7	0	100	100	95-100	70-100	28-45	7-20
McKamie	0-3	Silt loam	CL, CL-ML	A-6, A-4,	0	100	100	95-100	80-100	20-40	5-22
	3-38	Clay, silty clay	CH, CL	A-7	0	100	100	95-100	80-100	45-70	22-40
	38-72	Silty clay loam, silt loam, very fine sandy loam.	CL, CL-ML	A-4, A-6	0	100	100	95-100	50-95	20-40	5-22
24. Moreland	0-12	Silty clay	CH	A-7	0	100	95-100	90-100	90-100	51-74	25-45
	12-43	Clay, silty clay	CH	A-7	0	100	95-100	90-100	90-100	51-74	25-45
	43-72	Clay, silty clay loam, silty clay.	CH, CL	A-7, A-6	0	100	100	100	90-100	35-74	25-45
25. Muskogee	0-4	Silt loam	ML, CL, CL-ML	A-4	0	100	100	95-100	85-100	18-30	1-10
	4-27	Silty clay loam, silt loam.	CL, CH	A-6, A-7	0	100	100	95-100	90-100	35-55	15-30
	27-72	Silty clay, clay	CH	A-7	0	100	100	95-100	90-100	55-70	30-40
26. Oaklimeter	0-14	Silt loam	ML, CL, CL-ML	A-4	0	100	100	90-100	70-90	<30	NP-8
	14-72	Very fine sandy loam, silt loam, loam.	ML, CL, CL-ML	A-4	0	100	100	85-95	60-85	<30	NP-8
27, 28. Perry	0-4	Silty clay	CH, CL	A-7	0	100	100	100	95-100	45-75	22-45
	4-34	Clay	CH	A-7	0	100	100	100	95-100	60-80	33-50
	34-72	Clay, silty clay	CH, CL	A-7	0	90-100	85-100	75-100	70-100	45-80	22-50
29. Portland	0-3	Silty clay	CH	A-7	0	100	100	95-100	95-100	55-80	35-55
	3-22	Clay, silty clay	CH	A-7	0	100	100	95-100	95-100	60-90	40-60
	22-46	Clay, silty clay	CH	A-7	0	100	98-100	95-100	95-100	60-90	40-60
	46-72	Stratified very fine sandy loam to clay.	CH, CL	A-7, A-6	0	100	98-100	95-100	85-100	35-90	20-55
30, 31. Rilla	0-12	Silt loam	ML, CL-ML, CL	A-4	0	100	100	100	90-100	<31	NP-10
	12-55	Silty clay loam, clay loam, silt loam.	CL	A-6, A-4	0	100	100	100	90-100	28-40	8-17
	55-72	Loam, silty clay loam, silt loam.	CL-ML, CL	A-4, A-6, A-7	0	100	100	100	75-100	23-45	4-21
32. Sacul	0-9	Fine sandy loam	SM, ML	A-4	0	95-100	90-100	80-100	40-65	<20	NP-3
	9-32	Clay, silty clay	CH, CL	A-7	0	95-100	90-100	85-95	80-90	45-70	20-40
	32-72	Silty clay loam, clay loam, silty clay.	CL, CH, SC	A-6, A-7, A-4	0	95-100	90-100	85-100	40-90	25-55	8-32

See footnote at end of table.

TABLE 15.--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	
33---------------- Sawyer	0-5	Silt loam---------	ML, CL-ML	A-4	0	100	95-100	85-95	60-90	<25	NP-7
	5-32	Silty clay loam, loam, silt loam.	CL	A-6, A-4	0	100	95-100	85-95	70-90	30-40	10-20
	32-72	Silty clay, clay	CH, CL	A-7	0	100	95-100	90-100	80-90	45-60	20-35
34---------------- Smithdale	0-12	Sandy loam--------	SM, SM-SC	A-4	0	100	85-100	60-80	36-49	<20	NP-5
	12-72	Clay loam, sandy clay loam, loam.	SM-SC, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-95	45-75	23-38	7-15
35, 36------------ Stuttgart	0-20	Silt loam---------	CL, CL-ML	A-4, A-6	0	100	100	95-100	95-100	20-35	5-15
	20-31	Silty clay, silty clay loam.	CL, CH	A-7	0	100	100	95-100	95-100	41-65	20-40
	31-72	Silty clay loam, silt loam.	CL	A-4, A-6	0	100	100	95-100	95-100	25-40	8-20
37---------------- Taft	0-6	Silt loam---------	CL-ML, ML, CL	A-4	0	100	95-100	90-100	75-95	18-30	2-10
	6-28	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	100	95-100	95-100	85-95	23-38	5-16
	28-72	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6, A-7	0	95-100	90-100	85-100	80-95	23-42	5-20
38---------------- Tichnor	0-30	Silt loam---------	ML, CL, CL-ML	A-4, A-6, A-7	0	100	100	95-100	90-100	<35	NP-15
	30-60	Silty clay loam, silt loam.	CL	A-4, A-6 A-7	0	100	100	95-100	90-100	30-45	10-25
39---------------- Yorktown	0-6	Silty clay--------	MH, CH, OH	A-7	0	100	100	100	95-100	55-75	24-45
	6-44	Clay--------------	CH	A-7	0	100	100	100	95-100	60-80	32-50
	44-60	Clay--------------	CH	A-7	0	100	100	95-100	90-100	60-80	32-50

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	G/cm3	In/hr	In/in	pH				Pct
1----------------- Amy	0-19	15-25	1.25-1.60	0.6-2.0	0.13-0.24	4.5-5.5	Low-----------	0.43	5	.5-2
	19-66	20-32	1.25-1.50	0.06-0.2	0.16-0.24	4.5-5.5	Low-----------	0.43		
	66-72	15-35	1.25-1.60	0.6-2.0	0.11-0.15	4.5-5.5	Low-----------	0.43		
2----------------- Calhoun	0-18	10-27	1.30-1.65	0.2-0.6	0.21-0.23	4.5-6.0	Low-----------	0.49	3	.5-2
	18-72	18-35	1.30-1.70	0.06-0.2	0.20-0.22	4.5-7.8	Moderate------	0.43		
3----------------- Calloway	0-26	10-30	1.40-1.55	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49	3	.5-2
	26-60	10-32	1.35-1.55	0.06-0.2	0.09-0.12	4.5-6.0	Moderate------	0.43		
	60-72	16-32	1.45-1.55	0.06-0.2	0.09-0.12	5.1-7.8	Low-----------	0.43		
4----------------- Caspiana	0-11	10-27	1.30-1.65	0.6-2.0	0.21-0.23	5.6-8.4	Low-----------	0.37	5	2-4
	11-36	20-35	1.30-1.75	0.6-2.0	0.20-0.22	5.6-8.4	Moderate------	0.32		
	36-72	10-35	1.30-1.65	0.6-2.0	0.15-0.23	6.1-8.4	Low-----------	0.32		
5----------------- Commerce	0-5	14-27	1.35-1.65	0.6-2.0	0.21-0.23	5.6-7.8	Low-----------	0.37	5	2-4
	5-72	14-39	1.35-1.70	0.2-0.6	0.20-0.22	6.1-8.4	Moderate------	0.32		
6----------------- Commerce	0-5	14-27	1.35-1.65	0.6-2.0	0.21-0.23	5.6-7.8	Low-----------	0.37	5	2-4
	5-72	14-39	1.35-1.70	0.2-0.6	0.20-0.22	6.1-8.4	Moderate------	0.32		
7----------------- Crowley	0-22	10-27	1.30-1.65	0.2-0.6	0.20-0.23	4.5-8.4	Low-----------	0.43	4	.5-2
	22-53	35-50	1.20-1.80	<0.06	0.19-0.21	4.5-6.5	High----------	0.32		
	53-72	27-55	1.30-1.80	0.06-0.2	0.20-0.22	5.6-8.4	Moderate------	0.32		
8, 9-------------- Dubbs	0-12	5-18	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low-----------	0.37	5	.5-2
	12-38	20-35	1.45-1.55	0.6-2.0	0.18-0.22	4.5-6.0	Moderate------	0.37		
	38-52	10-25	1.40-1.50	2.0-6.0	0.20-0.22	4.5-6.0	Low-----------	0.37		
	52-72	5-20	1.40-1.50	2.0-6.0	0.10-0.15	4.5-6.0	Low-----------	0.32		
10---------------- Enders	0-8	10-25	1.25-1.60	0.6-2.0	0.15-0.22	3.6-5.5	Low-----------	0.43	3	2-4
	8-42	35-60	1.15-1.45	<0.06	0.09-0.13	3.6-5.5	High----------	0.24		
	42-52	35-60	1.25-1.45	<0.06	0.11-0.13	3.6-5.5	Moderate------	0.24		
	52-72	---	---	---	---	---	--------------	----		
11---------------- Hebert	0-14	10-27	1.30-1.65	0.6-2.0	0.21-0.23	5.1-7.3	Low-----------	0.37	4	.5-2
	14-36	14-35	1.30-1.80	0.2-0.6	0.18-0.22	4.5-6.5	Moderate------	0.32		
	36-72	10-35	1.30-1.80	0.6-2.0	0.18-0.22	5.1-7.8	Low-----------	0.37		
12, 13------------ Jackport	0-4	30-40	1.25-1.40	0.2-0.6	0.18-0.22	4.5-6.0	Moderate------	0.43	5	.5-2
	4-10	45-65	1.15-1.35	<0.06	0.12-0.18	4.5-5.5	High----------	0.32		
	10-36	60-80	1.15-1.30	<0.06	0.12-0.18	4.5-5.5	High----------	0.32		
	36-55	30-70	1.15-1.40	<0.06	0.12-0.18	4.5-7.8	High----------	0.32		
	55-72	25-50	1.20-1.45	<0.2	0.14-0.24	6.1-8.4	High----------	0.43		
14, 15------------ Keo	0-30	5-20	1.25-1.60	0.6-2.0	0.13-0.24	6.1-7.8	Low-----------	0.37	5	2-4
	30-72	10-30	1.25-1.60	0.6-6.0	0.07-0.24	6.6-8.4	Low-----------	0.37		
16, 17------------ Kobel	0-4	30-40	1.25-1.50	0.2-0.6	0.18-0.22	5.1-7.3	Moderate------	0.43	5	2-4
	4-56	35-55	1.15-1.50	<0.06	0.12-0.22	6.1-8.4	Very high-----	0.37		
	56-72	30-50	1.20-1.50	0.06-0.2	0.14-0.22	6.6-8.4	High----------	0.37		
18, 19------------ Leadvale	0-6	12-22	1.30-1.40	0.6-2.0	0.17-0.22	4.5-5.5	Low-----------	0.43	3	.5-2
	6-11	20-32	1.30-1.50	0.6-2.0	0.17-0.20	4.5-5.5	Low-----------	0.43		
	11-28	20-35	1.55-1.70	0.06-0.6	0.06-0.11	4.5-5.5	Low-----------	0.43		
	28-72	20-45	1.40-1.60	0.06-0.6	0.06-0.11	4.5-5.5	Low-----------	0.24		
20*:										
Linker-----------	0-4	5-20	1.30-1.60	0.6-2.0	0.09-0.15	3.6-5.5	Low-----------	0.20	3	.5-3
	4-38	18-35	1.30-1.60	0.6-2.0	0.11-0.20	3.6-5.5	Low-----------	0.32		
	38-40	---	---	---	---	---	--------------	----		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	G/cm3	In/hr	In/in	pH				Pct
20*:										
Enders----------	0-8	10-25	1.25-1.60	0.6-2.0	0.15-0.22	3.6-5.5	Low----------	0.43	3	2-4
	8-42	35-60	1.15-1.45	<0.06	0.09-0.13	3.6-5.5	High---------	0.24		
	42-52	35-60	1.25-1.45	<0.06	0.11-0.13	3.6-5.5	Moderate-----	0.24		
	52-72	---	---	---	---	---	-------------	----		
Mountainburg----	0-9	4-12	1.30-1.60	2.0-6.0	0.05-0.10	4.5-6.0	Low----------	0.17	1	.5-4
	9-18	10-18	1.30-1.60	2.0-6.0	0.05-0.10	4.5-5.5	Low----------	0.24		
	18-20	---	---	---	---	---	-------------	----		
21, 22----------- Loring	0-5	8-18	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low----------	0.43	3	.5-2
	5-26	18-35	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low----------	0.43		
	26-58	12-25	1.50-1.70	0.2-0.6	0.06-0.13	4.5-6.0	Low----------	0.43		
	58-72	10-25	1.30-1.60	0.6-2.0	0.06-0.13	4.5-6.5	Low----------	0.43		
23*:										
Loring----------	0-5	8-18	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low----------	0.43	3	.5-2
	5-26	18-35	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low----------	0.43		
	26-58	12-25	1.50-1.70	0.2-0.6	0.06-0.13	4.5-6.0	Low----------	0.43		
	58-72	10-25	1.30-1.60	0.6-2.0	0.06-0.13	4.5-6.5	Low----------	0.43		
McKamie---------	0-3	18-35	1.42-1.76	0.6-2.0	0.16-0.22	5.1-6.5	Moderate-----	0.43	3	.5-2
	3-38	35-60	1.20-1.45	<0.06	0.18-0.20	4.5-6.0	High---------	0.32		
	38-72	14-35	1.40-1.76	0.2-2.0	0.14-0.22	4.5-8.4	Moderate-----	0.37		
24--------------- Moreland	0-12	39-50	1.20-1.50	<0.06	0.18-0.20	6.1-7.8	Very high----	0.32	5	2-4
	12-43	39-60	1.20-1.45	<0.06	0.18-0.20	6.6-8.4	Very high----	0.32		
	43-72	27-60	1.20-1.75	.06-0.6	0.18-0.21	7.4-8.4	High---------	0.32		
25--------------- Muskogee	0-4	10-27	1.25-1.50	0.6-2.0	0.16-0.24	4.5-6.0	Low----------	0.43	5	.5-2
	4-27	20-40	1.25-1.45	0.2-0.6	0.16-0.24	4.5-6.0	Moderate-----	0.37		
	27-72	30-55	1.20-1.45	0.06-0.2	0.14-0.18	4.5-7.8	High---------	0.32		
26--------------- Oaklimeter	0-14	10-16	1.40-1.50	0.6-2.0	0.20-0.22	4.5-5.5	Low----------	0.43	5	.5-2
	14-72	7-18	1.40-1.50	0.6-2.0	0.15-0.20	4.5-5.5	Low----------	0.43		
27, 28----------- Perry	0-4	40-80	1.20-1.60	<0.06	0.17-0.20	4.5-6.0	High---------	0.32	5	2-4
	4-34	55-85	1.17-1.50	<0.06	0.17-0.20	5.1-7.3	Very high----	0.28		
	34-72	55-85	1.17-1.50	<0.06	0.17-0.20	6.1-8.4	Very high----	0.28		
29--------------- Portland	0-3	40-60	1.15-1.50	<0.06	0.12-0.18	4.5-5.5	High---------	0.32	5	2-4
	3-22	60-85	1.15-1.45	<0.06	0.12-0.18	4.5-5.5	High---------	0.32		
	22-46	60-85	1.15-1.45	<0.06	0.12-0.18	6.1-8.4	High---------	0.32		
	46-72	15-60	1.15-1.55	.06-0.6	0.12-0.22	6.1-8.4	High---------	0.32		
30, 31----------- Rilla	0-12	14-27	1.30-1.80	0.6-2.0	0.21-0.23	4.5-7.3	Low----------	0.37	5	.5-2
	12-55	18-35	1.30-1.80	0.6-2.0	0.20-0.22	3.6-5.5	Moderate-----	0.32		
	55-72	20-35	1.20-1.80	0.6-2.0	0.18-0.22	4.5-8.4	Low----------	0.32		
32--------------- Sacul	0-9	5-25	1.30-1.50	0.6-2.0	0.10-0.20	4.5-5.5	Low----------	0.32	3	.5-2
	9-32	35-60	1.20-1.35	0.06-0.2	0.12-0.18	4.5-5.5	High---------	0.32		
	32-72	20-40	1.25-1.45	0.2-0.6	0.16-0.24	4.5-5.5	Moderate-----	0.37		
33--------------- Sawyer	0-5	15-25	1.25-1.60	0.6-2.0	0.15-0.24	4.5-5.5	Low----------	0.43	3	.5-2
	5-32	20-35	1.25-1.60	0.2-0.6	0.15-0.24	4.5-5.5	Moderate-----	0.37		
	32-72	40-60	1.15-1.50	0.06-0.2	0.12-0.18	4.5-5.5	High---------	0.32		
34--------------- Smithdale	0-12	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low----------	0.28	5	.5-2
	12-72	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low----------	0.24		
35, 36----------- Stuttgart	0-20	10-27	1.30-1.65	0.2-0.6	0.22-0.30	5.1-7.3	Low----------	0.43	3	.5-2
	20-31	35-50	1.20-1.80	<0.06	0.14-0.22	4.5-6.5	High---------	0.32		
	31-72	27-40	1.30-1.80	<0.06	0.08-0.12	5.1-7.8	Moderate-----	0.37		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	G/cm3	In/hr	In/in	pH				Pct
37----------------- Taft	0-6	10-25	1.30-1.40	0.6-2.0	0.20-0.22	4.5-5.5	Low-----------	0.43	3	.5-2
	6-28	18-35	1.30-1.50	0.6-2.0	0.18-0.20	4.5-5.5	Low-----------	0.43		
	28-72	15-35	1.50-1.65	0.06-0.2	0.03-0.07	4.5-5.5	Low-----------	0.43		
38----------------- Tichnor	0-30	10-27	1.30-1.65	0.6-2.0	0.16-0.24	4.5-6.0	Low-----------	0.43	5	2-4
	30-72	18-35	1.30-1.70	0.06-0.2	0.16-0.24	4.5-6.0	Moderate------	0.37		
39----------------- Yorktown	0-6	40-65	1.15-1.45	<0.06	0.12-0.18	5.6-7.3	High----------	0.32	5	>4
	6-44	60-80	1.15-1.45	<0.06	0.12-0.18	5.6-7.3	Very high----	0.32		
	44-60	60-80	1.15-1.45	<0.06	0.12-0.18	7.4-8.4	Very high----	0.32		

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hard-ness	Uncoated steel	Concrete
					Ft			In			
1----------------- Amy	D	Frequent----	Brief to very long.	Dec-Jun	0-1.0	Perched	Dec-Apr	>60	---	High-----	Moderate.
2----------------- Calhoun	D	None--------	---	---	0.5-2.0	Perched	Dec-Apr	>60	---	High-----	Moderate.
3----------------- Calloway	C	None--------	---	---	1.0-2.0	Perched	Jan-Apr	>60	---	High-----	Moderate.
4----------------- Caspiana	B	None--------	---	---	>4.0	Apparent	Dec-Apr	>60	---	Moderate	Low.
5----------------- Commerce	C	None--------	---	---	1.5-4.0	Apparent	Dec-Apr	>60	---	High-----	Low.
6----------------- Commerce	C	Frequent----	Brief to long.	Dec-May	1.5-4.0	Apparent	Dec-Apr	>60	---	High-----	Low.
7----------------- Crowley	D	None--------	---	---	0.5-1.5	Perched	Dec-Apr	>60	---	High-----	Moderate.
8, 9-------------- Dubbs	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
10---------------- Enders	C	None--------	---	---	>6.0	---	---	40-60	Soft	High-----	High.
11---------------- Hebert	C	None--------	---	---	1.5-3.0	Apparent	Dec-Apr	>60	---	High-----	Moderate.
12, 13------------ Jackport	D	None--------	---	---	0-1.0	Perched	Dec-Apr	>60	---	High-----	High.
14, 15------------ Keo	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Low.
16---------------- Kobel	D	None--------	---	---	0-1.0	Perched	Dec-Apr	>60	---	High-----	Moderate.
17---------------- Kobel	D	Frequent----	Brief to long.	Oct-May	0-1.0	Perched	Dec-Apr	>60	---	High-----	Moderate.
18, 19------------ Leadvale	C	None--------	---	---	2.0-3.0	Perched	Jan-Apr	>48	Soft	Moderate	Moderate.
20*:											
Linker-----------	B	None--------	---	---	>6.0	---	---	20-40	Hard	Low------	High.
Enders-----------	C	None--------	---	---	>6.0	---	---	40-60	Soft	High-----	High.
Mountainburg-----	D	None--------	---	---	>6.0	---	---	12-20	Hard	Low------	Moderate.
21, 22------------ Loring	C	None--------	---	---	2.0-3.0	Perched	Dec-Mar	>60	---	Moderate	Moderate.
23*:											
Loring-----------	C	None--------	---	---	2.0-3.0	Perched	Dec-Mar	>60	---	Moderate	Moderate.
McKamie----------	D	None--------	---	---	>6.0	---	---	>60	---	High-----	Moderate.
24---------------- Moreland	D	None--------	---	---	0-1.5	Perched	Dec-Apr	>60	---	High-----	Low.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hard-ness	Uncoated steel	Concrete
					Ft			In			
25----------------- Muskogee	C	None---------	---	---	1.0-2.0	Perched	Jan-Apr	>60	---	High------	Moderate.
26----------------- Oaklimeter	C	Occasional	Brief to long.	Nov-Apr	1.5-2.5	Apparent	Nov-Mar	>60	---	Moderate	High.
27----------------- Perry	D	None---------	---	---	0-2.0	Apparent	Dec-Apr	>60	---	High------	Moderate.
28----------------- Perry	D	Frequent----	Brief to long.	Dec-May	0-2.0	Apparent	Dec-Apr	>60	---	High------	Moderate.
29----------------- Portland	D	None---------	---	---	0-1.0	Perched	Dec-May	>60	---	High------	Moderate.
30, 31------------- Rilla	B	None---------	---	---	4.0-6.0	Apparent	Dec-Apr	>60	---	Moderate	High.
32----------------- Sacul	C	None---------	---	---	>6.0	---	---	>60	---	High------	Moderate.
33----------------- Sawyer	C	None---------	---	---	2.0-3.0	Perched	Dec-Apr	>60	---	High------	High.
34----------------- Smithdale	B	None---------	---	---	>6.0	---	---	>60	---	Low-------	Moderate.
35, 36------------- Stuttgart	D	None---------	---	---	1.0-2.0	Perched	Dec-Apr	>60	---	High------	Low.
37----------------- Taft	C	None---------	---	---	1.0-2.0	Perched	Jan-Apr	>60	---	High------	High.
38----------------- Tichnor	D	Frequent----	Brief to long.	Dec-May	0-1.0	Perched	Dec-May	>60	---	High------	Moderate.
39----------------- Yorktown	D	Frequent----	Very long	Oct-Aug	+5-0.5	Apparent	Oct-Aug	>60	---	High------	Moderate.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Amy	Fine-silty, siliceous, thermic Typic Ochraquults
Calhoun	Fine-silty, mixed, thermic Typic Glossaqualfs
Calloway	Fine-silty, mixed, thermic Glossaquic Fragiudalfs
Caspiana	Fine-silty, mixed, thermic Typic Argiudolls
Commerce	Fine-silty, mixed, nonacid, thermic Aeric Fluvaquents
Crowley	Fine, montmorillonitic, thermic Typic Albaqualfs
Dubbs	Fine-silty, mixed, thermic Typic Hapludalfs
Enders	Clayey, mixed, thermic Typic Hapludults
Hebert	Fine-silty, mixed, thermic Aeric Ochraqualfs
Jackport	Very-fine, montmorillonitic, thermic Vertic Ochraqualfs
Keo	Coarse-silty, mixed, thermic Dystric Fluventic Eutrochrepts
Kobel	Fine, montmorillonitic, nonacid, thermic Vertic Haplaquepts
Leadvale	Fine-silty, siliceous, thermic Typic Fragiudults
Linker	Fine-loamy, siliceous, thermic Typic Hapludults
Loring	Fine-silty, mixed, thermic Typic Fragiudalfs
McKamie	Fine, mixed, thermic Vertic Hapludalfs
Moreland	Fine, mixed, thermic Vertic Hapludolls
Mountainburg	Loamy-skeletal, siliceous, thermic Lithic Hapludults
Muskogee	Fine-silty, mixed, thermic Aquic Paleudalfs
Oaklimeter	Coarse-silty, mixed, thermic Fluvaquentic Dystrochrepts
Perry	Very-fine, montmorillonitic, nonacid, thermic Vertic Haplaquepts
Portland	Very-fine, mixed, nonacid, thermic Vertic Haplaquepts
Rilla	Fine-silty, mixed, thermic Typic Hapludalfs
Sacul	Clayey, mixed, thermic Aquic Hapludults
Sawyer	Fine-silty, siliceous, thermic Aquic Paleudults
Smithdale	Fine-loamy, siliceous, thermic Typic Paleudults
Stuttgart	Fine, montmorillonitic, thermic Typic Natrudalfs
Taft	Fine-silty, siliceous, thermic Glossaquic Fragiudults
Tichnor	Fine-silty, mixed, thermic Typic Ochraqualfs
Yorktown	Very-fine, montmorillonitic, nonacid, thermic Typic Fluvaquents

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