

SOIL SURVEY OF
Saline County, Arkansas



United States Department of Agriculture
Soil Conservation Service

in cooperation with

Arkansas Agricultural Experiment Station

HOW TO USE



This is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and agencies of the States, usually the Agricultural Experiment Stations. In some surveys, other Federal and local agencies also contribute. The Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in the period 1971-75. Soil names and descriptions were approved in 1976. Unless otherwise indicated, statements in the publication refer to conditions in the survey area in 1976. 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 Saline County Conservation District.

Soil maps in this survey may be copied without permission, but any enlargement of these maps can cause misunderstanding of the detail of mapping and result in erroneous interpretations. Enlarged maps do not show small areas of contrasting soils that could have been shown at a larger mapping scale.

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Foreword

The Soil Survey of Saline County, Arkansas contains much information useful in any land-planning program. Of prime importance are the predictions of soil behavior for selected land uses. Also highlighted are limitations or hazards to land uses that are inherent in the soil, improvements needed to overcome these limitations, and the impact that selected land uses will have on the environment.

This soil survey has been prepared for many different users. Farmers, ranchers, foresters, and agronomists can use it to determine the potential of the soil and the management practices required for food and fiber production. Planners, community officials, engineers, developers, builders, and homebuyers can use it to plan land use, select sites for construction, develop soil resources, or identify any special practices that may be needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the soil survey to help them understand, protect, and enhance the environment.

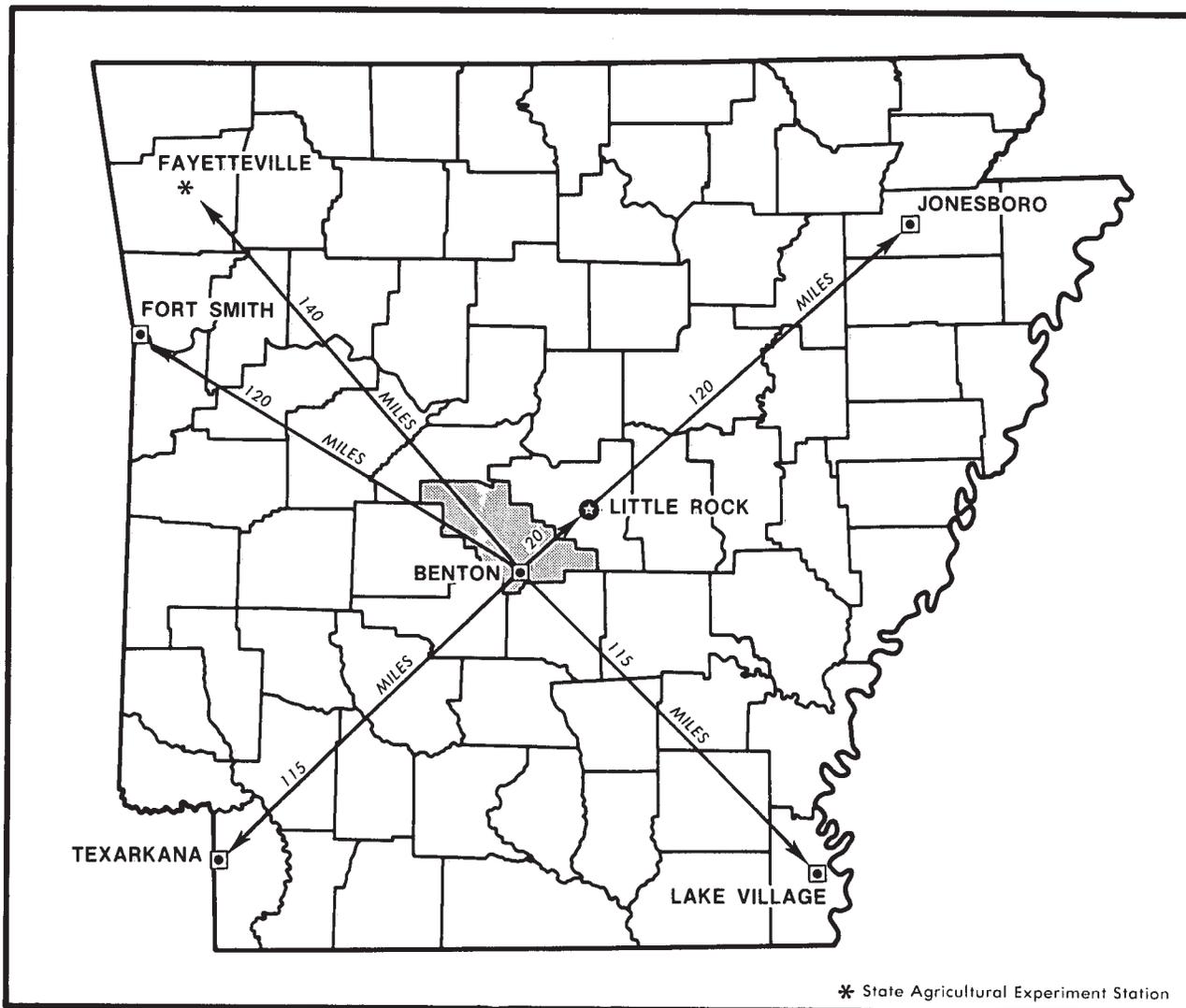
Great differences in soil properties can occur even within short distances. Soils may be seasonally wet or subject to flooding. They may be shallow to bedrock. They may be too unstable to be used as a foundation for buildings or roads. Very clayey or wet soils are poorly suited to septic tank absorption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

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map; the location of each kind of soil is shown on detailed soil maps. Each kind of soil in the survey area is described, and much information is given about each soil for specific uses. Additional information or assistance in using this publication can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

This soil survey can be useful in the conservation, development, and productive use of soil, water, and other resources.



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Location of Saline County in Arkansas.

SOIL SURVEY OF SALINE COUNTY, ARKANSAS

By George J. Haley, Soil Conservation Service
Soils surveyed by George J. Haley, Dorris F. Festervand, Randle O. Buchner,
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United States Department of Agriculture, Soil Conservation Service,
in cooperation with the Arkansas Agricultural Experiment Station

SALINE COUNTY, ARKANSAS is in the central part of Arkansas (see facing page). The area of the county is 463,168 acres, or about 728 square miles, including about 4,793 acres of water.

Saline County is bounded on the south by Garland, Hot Spring, and Grant Counties, on the west by Perry and Garland Counties, on the north by Perry and Pulaski Counties, and on the east by Pulaski County.

In 1970, the population was 36,107. Benton, the county seat and main trading center, had a population of 16,499.

sea level. Elevation decreases toward the east and south. In the eastern and southern part it ranges from about 270 to 500 feet.

The northern part of Saline County has irregular topography. The southern part, on the Gulf Coastal Plain, is nearly level or gently rolling. Elevation ranges from 270 feet just southeast of Benton to 1,800 feet near Lake Winona.

Most of the county is drained by the Saline River, which is a part of the Ouachita River Basin. The northern

Farms in Saline County, as in most of the State, are water holding capacity of sandy or gravelly soils results
low and increasing in size. Between in brief droughts on these soils nearly every year. Snow

1.

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the kinds of rock; and many facts about the soils. They dug many holes to expose 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 the action of plant roots.

The soil scientists recorded the characteristics of the profiles they studied, and they compared those profiles with others in counties nearby and in places more distant. Thus, through correlation, they classified and named the soils according to nationwide, uniform procedures.

After a guide for classifying and naming the soils was worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, roads, and other details that help in drawing boundaries accurately. The soil map at the back of this publication was prepared from aerial photographs.

The areas shown on a soil map are called soil map units. Some map units are made up of one kind of soil, others are made up of two or more kinds of soil, and a few have little or no soil material at all. Map units are discussed in the sections "General soil map for broad land use planning" and "Soil maps for detailed planning."

While a soil survey is in progress, samples of soils are taken as needed for laboratory measurements and for engineering tests. The soils are field tested, and interpretations of their behavior are modified as necessary during the course of the survey. New interpretations are added to meet local needs, mainly through field observations of different kinds of soil in different uses under different levels of management. Also, data are assembled from other sources, such as test results, records, field experience, and information available from state and local specialists. For example, data on crop yields under defined practices 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 is readily available to different groups of users, among them farmers, managers of rangeland and woodland, engineers, planners, developers and builders, homebuyers, and those seeking recreation.

General soil map for broad land use planning

The general soil map at the back of this publication shows, in color, map units that have a distinct pattern of soils and of relief and drainage. Each map unit 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 provides a broad perspective of the soils and landscapes in the survey area. It provides a basis for comparing the potential of large areas for general kinds of land use. Areas that are, for the most part, suited to certain kinds of farming or to other land uses can be identified on the map. Likewise, areas of soils having properties that are distinctly unfavorable for certain land uses can be located.

Because of its small scale, the map does not show the kind of soil at a specific site. Thus, it 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 kinds of soil in any one map unit differ from place to place in slope, depth, stoniness, drainage, or other characteristics that affect their management.

The soils in the survey area vary widely in their potential for major land uses. Soil properties that pose limitations to the use are indicated. The ratings of soil potential are based on the assumption that practices in common use in the survey area are being used to overcome soil limitations. These ratings reflect the ease of overcoming the soil limitations and the probability of soil problems persisting after such practices are used.

Major land uses considered are cultivated farm crops, specialty crops, woodland, and urban uses. Cultivated farm crops are those grown extensively by farmers in the survey area. Specialty crops include vegetables, fruits, and nursery crops grown on limited acreage and generally requiring intensive management. Woodland refers to land that is producing either trees native to the area or introduced species. Urban uses include residential, commercial, and industrial developments.

1. Carnasaw-Townley-Pirum

Well drained, undulating to steep, moderately deep and deep, gravelly and stony loamy soils on hills, mountains, ridges, and colluvial areas

This unit is in the northwestern part of Saline County. Carnasaw and Townley soils are on the tops of hills and mountains, on side slopes and benches, and on low ridges within valleys. They formed in a thin layer of loamy material and the underlying clayey material weathered from shale. This material is underlain by tilted and fractured shale, sandstone, or quartzite. Pirum soils are in colluvial positions. They formed in loamy colluvial material over bedrock that is tilted and fractured shale, sandstone, or quartzite.

This unit occupies about 12 percent of the county. It is about 43 percent Carnasaw soils, 25 percent Townley soils, 21 percent Pirum soils, and 11 percent rock outcrop and water areas.

The Carnasaw and Townley soils are dominantly at higher elevations than Pirum soils. All are well drained. Carnasaw and Townley soils have a gravelly silt loam surface layer and a clayey subsoil. Pirum soils have a loamy surface layer and subsoil. The depth to underlying shale is 30 to 60 inches in Carnasaw soils, 20 to 40 inches in Townley soils, and 22 to 50 inches in Pirum soils.

This unit is mainly woodland. Cleared areas are used mainly for pasture. Steep slopes, the depth to bedrock, the gravelly or stony surface layer, and the clayey subsoil are the main limitations.

This unit has fair potential for woodland and poor potential for row crops and pasture. Because of steep slopes, the depth to bedrock, the stony or gravelly surface layer, the clayey subsoil, and low strength, the soils in this unit have poor potential for residential and urban uses.

2. Carnasaw-Townley

Well drained, undulating to steep, moderately deep and deep, gravelly and stony loamy soils on hills, mountains, and ridges

This unit is in the northern and western parts of the county, on the tops of hills and mountains, on side slopes and benches, and on low ridges within valleys. The soils formed in a thin layer of loamy material and the underlying

This unit is in the south-central part of Saline County, on flood plains of local streams and drainageways. The soils formed in thick beds of loamy sediment.

This unit occupies about 10 percent of the county. It is about 56 percent Amy soils and 44 percent Ouachita soils.

In most places Amy soils are slightly lower in elevation than Ouachita soils. Amy soils are poorly drained, and Ouachita soils are well drained. Both soils have a silt loam surface layer and formed in thick beds of loamy sediment. Amy soils have a seasonal high water table.

This unit is mainly woodland, but a few small areas of better drained soils are cleared and mostly in pasture. Frequent flooding and wetness are the main limitations.

This unit has good potential for woodland and poor potential for row crops and pasture. Because of frequent flooding, this unit has poor potential for residential and urban uses.

4. Tiak-Savannah

Moderately well drained, nearly level to moderately sloping loamy soils on uplands and stream terraces

underlain by tilted and fractured shale, sandstone, or quartzite.

This unit occupies about 49 percent of the county. It is about 47 percent Carnasaw soils, 21 percent Townley soils, and 32 percent soils of minor extent.

The Carnasaw and Townley soils are well drained. Typ-

This unit is in the eastern part of Saline County, on broad flats broken by ridges. The soils formed in thick beds of loamy and clayey sediments. Natural drainageways are mainly slow-flowing intermittent streams.

This unit occupies about 8 percent of the county. It is

Udorthents are areas altered by mining. Sherwood soils are the undisturbed areas in this unit. Udorthents are excessively drained, have variable soil material, and in most areas are barren of vegetation. The well drained Sherwood soils have a loamy surface layer and subsoil and are underlain by weathered nepheline-syenite bedrock at a depth of 30 to 50 inches.

This unit is mainly woodland. Many tracts are idle and

broad flats and stream terraces along natural drainageways. They are poorly drained and have a loamy surface layer and subsoil. Minor in this unit are the well drained Saffell soils.

This unit is mainly woodland. Some small tracts are used for cultivated crops and pasture. Wetness and erosion are the main limitations.

Smithdale and Savannah soils have fair potential for

water capacity, the high acidity, and the rock outcrop are the main limitations.

This unit has poor potential for woodland and row

Amy soils have poor potential for cultivated crops. The gently sloping Savannah soil has fair potential. Smithdale soils have good potential for residential and urban uses,

potential for urban development because of steep slopes, moderate depth to bedrock, a gravelly or stony surface layer, and a clayey subsoil.

Some areas of the county are soils that can be developed for urban uses at lower cost than can the soils of the Amy-Ouachita and the Carnasaw-Townley-Pirum units. The Smithdale soil in the Smithdale-Savannah-Amy unit is an example. The Linker soil in the Allen-Linker

sion, stoniness, salinity, wetness, or other characteristics that affect their use. On the basis of such differences, a soil series is divided into phases. The name of a *soil phase* commonly indicates a feature that affects use or management. For example, Avilla silt loam, 1 to 3 percent slopes, is one of several phases within the Avilla series.

Some map units are made up of two or more dominant kinds of soil. Such map units are called soil *complexes*.

Map unit descriptions

1—Allen loam, 20 to 40 percent slopes. This well drained, steep soil is on mountainsides. Individual areas are about 50 to 300 acres.

Typically the surface layer is very dark grayish brown

is adequate, suitable crops are soybeans and winter small grain.

This soil has good potential for loblolly pine and sweetgum. Wetness, the main limitation to the use of equipment in managing and harvesting the tree crop, can usually be overcome by logging during the drier seasons.

Amy silt loam makes up about 75 percent of each mapped area. Typically, the surface layer is grayish brown silt loam about 3 inches thick. The subsurface layer is light brownish gray, mottled silt loam about 9 inches thick. The subsoil is light gray, mottled silt loam to a depth of about 45 inches. The underlying material is gray, mottled silty clay loam that extends to more than 72 inches.

This soil is low in natural fertility. The available water capacity is high. The surface layer and subsoil are

grain. The soil responds well to fertilization. Erosion is a hazard if cultivated crops are grown. Minimum tillage, contour farming, and the use of cover crops, including grasses and legumes in the cropping system, help to reduce runoff and control erosion.

This soil has good potential for loblolly pine, shortleaf pine, and sweetgum. There are no significant limitations in woodland use and management.

This soil has poor potential for most urban uses. Shrink-swell and low strength are moderate limitations

noff are slow. The water table is seasonally high. It is within 12 inches of the surface in winter and early in spring.

Soils on the rounded mounds make up about 25 percent of each mapped area. They have a variable profile but are generally brownish, acid loamy material throughout.

This unit has low potential for cultivated crops because excess water is a severe hazard on the Amy soils. Field-work is delayed several days after rain unless surface drains are installed. The mounds limit the use of some kinds of farm equipment. Most areas are pasture and meadow.

This unit has good potential for loblolly pine and sweet

severe limitation for roads and streets. Slow percolation is a severe limitation for septic tank absorption fields. All are difficult to overcome. Capability unit IIIe-1; woodland suitability group 2w8; pasture and hayland group 7A.

6—Avilla silt loam, 1 to 3 percent slopes. This well drained, nearly level soil is on stream terraces in valleys of the Ouachita Mountains. Individual areas are 20 to 150 acres.

Typically, the surface layer is brown silt loam about 3 inches thick. The subsurface layer is dark yellowish brown silt loam about 6 inches thick. The subsoil is yellowish red and red clay loam to a depth of about 31

Typically, the surface layer is brown silt loam about 3 inches thick. The subsurface layer is dark yellowish brown silt loam about 6 inches thick. The subsoil is yellowish red and red clay loam to a depth of about 31 inches; mottled red, brown, and yellow clay loam to about 56 inches; and mottled red, brown, and gray very gravelly clay loam that extends to 72 inches or more.

loam about 2 inches thick. The subsurface layer is yellowish brown silt loam about 9 inches thick. The subsoil is yellowish brown silt loam to a depth of about 23 inches and silt loam mottled in shades of gray, brown, and red to about 42 inches. The underlying material is brown, mottled very gravelly loam that extends to 72 inches or more.

This soil is moderate in natural fertility. Reaction ranges from medium acid to very strongly acid unless the

Included with this soil in mapping are a few intermin-

The Carnasaw soil is low in natural fertility. It is strongly acid or very strongly acid throughout unless the surface layer has been limed. Permeability is slow, and the available water capacity is medium.

Townley silt loam makes up about 30 percent of the unit. Typically, it has a brown surface layer about 6 inches thick. The subsoil is yellowish red silty clay loam, red silty clay, and yellowish red silty clay to a depth of about 23 inches. The underlying material is tilted and fractured shale that extends to 25 inches or more.

The Townley soil is low in natural fertility. It is strongly acid to extremely acid unless the surface layer has been limed. Permeability is slow, and the available water capacity is low.

The remaining 30 percent of the unit is loamy soils that are 20 to 40 inches deep over bedrock, soils that are similar to the Townley soil but are less than 18 inches

The Carnasaw soil is low in natural fertility. It is strongly acid or very strongly acid throughout unless the surface layer has been limed. Permeability is slow, and the available water capacity is medium.

Townley silt loam makes up 20 percent of the unit. Typically, it has a brown surface layer about 6 inches thick. The subsoil is yellowish red silty clay loam, red silty clay, and yellowish red silty clay to a depth of about 23 inches. The underlying material is tilted and fractured shale that extends to 25 inches or more.

The Townley soil is low in natural fertility. It is strongly acid to extremely acid unless the surface layer has been limed. Permeability is slow, and the available water capacity is low.

The remaining 20 percent is areas of loamy soils that are 20 to 40 inches deep to bedrock, soils that are similar to the Townley soil but are less than 18 inches deep to tilted bedrock (Fig. 2) soils that are similar to the Carnasaw soil.



Carnasaw gravelly silt loam makes up about 45 percent of the unit. Typically, it has a very dark grayish brown surface layer about 1 inch thick. The subsurface layer is strong brown gravelly silt loam about 2 inches thick. The subsoil is yellowish red silty clay loam and red clay to a depth of 21 inches and red, mottled clay and silty clay to about 40 inches. The underlying material is mottled gray, red, and yellow soft shale that extends to 72 inches or more.

The Carnasaw soil is low in natural fertility. It is strongly acid or very strongly acid throughout unless the surface layer has been limed. Permeability is slow, and the available water capacity is medium.

Pirum loam makes up about 25 percent of the unit. Typically, it has a brown surface layer about 2 inches thick. The subsurface layer is light yellowish brown loam about 8 inches thick. The subsoil is yellowish brown and strong brown loam to a depth of about 34 inches. The underlying material is hard tilted shale bedrock.

The Pirum soil is low in natural fertility. It is strongly acid or very strongly acid unless the surface layer has been limed. Permeability is moderate, and the available water capacity is low.

Townley silt loam makes up about 23 percent of the unit. Typically, it has a brown surface layer about 6 inches thick. The subsoil is yellowish red silty clay loam, red silty clay, and yellowish red silty clay to a depth of about 23 inches. The underlying material is tilted and fractured shale that extends to 25 inches or more.

The Townley soil is low in natural fertility. It is strongly acid to extremely acid unless the surface layer has been limed. Permeability is slow, and the available water capacity is low.

The remaining 7 percent of the unit is small areas of rock outcrop, soils that are similar to the Carnasaw soil but are more than 60 inches deep to bedrock, and soils that are similar to the Townley soil but are less than 18 inches deep to bedrock.

This unit has poor potential for cultivated crops. It is best suited to wildlife habitat and woodland. A few small areas are pasture. Surface stones, droughtiness in the Townley soil, and irregular slopes make pasture management difficult. Suitable pasture plants are bahiagrass, bermudagrass, white clover, sericea lespedeza, and annual lespedeza. Runoff is medium to rapid, and the hazard of erosion is very severe.

This unit has fair potential for loblolly and shortleaf pine. There are no significant limitations in woodland use and management.

This unit has poor potential for most urban uses. High shrink-swell and low strength are severe limitations for dwellings, local roads and streets, and industrial sites on the Carnasaw and Townley soils. Depth to bedrock is a severe limitation for septic tank absorption fields, dwellings with basements, and industrial sites on the Pirum soil. Slow percolation is a severe hazard for septic tank absorption fields on the Carnasaw and Townley soils. Depth to bedrock and low strength are moderate limita-

tions for local roads and streets on the Pirum soil. These limitations are difficult or impractical to overcome. Carnasaw soil in capability unit IVE-1, woodland suitability group 3o1, pasture and hayland group 8A; Pirum soil in capability unit IIIe-3, woodland suitability group 3o7, pasture and hayland group 8A; Townley soil in capability unit IVE-1, woodland suitability group 4o1, pasture and hayland group 8A.

12—Carnasaw-Townley-Pirum association, steep. This unit consists of well drained soils in an irregular pattern, but in about the same relative proportions in each area. It is at the higher elevations in the Ouachita Mountains. The deeper Carnasaw soils and the shallower Townley soils are on the tops and sides of hills, benches, and mountains. They formed in a thin layer of loamy material and the underlying clayey material weathered from shale. The Pirum soils are in colluvial positions. They formed in loamy colluvial material over bedrock. Slopes range from 12 to 40 percent. The mapped areas range from about 100 to 800 acres.

Carnasaw gravelly silt loam makes up about 41 percent of the unit. Typically, it has a very dark grayish brown surface layer about 1 inch thick. The subsurface layer is strong brown about 2 inches thick. The subsoil is yellowish red silty clay loam and red clay to a depth of 21 inches and red, mottled clay and silty clay to about 40 inches. The underlying material is mottled gray, red, and yellow soft shale that extends to 72 inches or more.

The Carnasaw soil is low in natural fertility. It is strongly acid or very strongly acid throughout unless the surface layer has been limed. Permeability is slow, and the available water capacity is medium.

Townley silt loam makes up 31 percent of the unit. Typically, it has a brown surface layer about 6 inches thick. The subsoil is yellowish red silty clay loam, red silty clay, and yellowish red silty clay that extends to a depth of about 23 inches. The underlying material is tilted and fractured shale that extends to 25 inches or more.

The Townley soil is low in natural fertility. It is strongly acid to extremely acid unless the surface layer has been limed. Permeability is slow, and the available water capacity is low.

Pirum loam makes up 18 percent of the unit. Typically, it has a brown surface layer about 2 inches thick. The subsurface layer is light yellowish brown loam about 8 inches thick. The subsoil is yellowish brown and strong brown loam that extends to a depth of about 34 inches. The underlying material is hard tilted shale bedrock.

The Pirum soil is low in natural fertility. It is strongly acid or very strongly acid unless the surface layer has been limed. Permeability is moderate, and the available water capacity is low.

The remaining 10 percent of the unit is small areas of sandstone or shale outcrop, soils that are similar to the Carnasaw soil but are more than 60 inches deep to bedrock, soils that are similar to the Townley soil but are less than 18 inches deep to bedrock, and areas where slopes are as much as 60 percent.

This unit has poor potential for cultivated crops. It is best suited to wildlife habitat and woodland. A few small areas are pasture. Stones on the surface, droughtiness,

This soil has fair potential for loblolly pine and short-leaf pine. There are no significant limitations in woodland use or management.

Suitable pasture plants are bahiagrass, bermudagrass, white clover, sericea lespedeza, and annual lespedeza. Runoff is rapid, and the hazard of erosion is very severe.

Potential is fair for loblolly and shortleaf pines. Steep slopes and seedling mortality are the main limitations in woodland use and management.

This unit has poor potential for most urban uses. High shrink-swell, steep slopes, and low strength are severe limitations for dwellings, local roads and streets, and industrial sites on the Carnasaw and Townley soils. Depth to bedrock and steep slopes are severe limitations for septic tank absorption fields, dwellings with basements, and industrial sites on the Pirum soil. Slow percolation

ness is a moderate limitation for dwellings and industrial sites. Low strength is a moderate limitation for roads and streets. Slow percolation is a severe limitation for septic tank absorption fields. All are difficult to overcome. Capability unit IIe-3; woodland suitability group 3o7; pasture and hayland group 8A.

14—Leadvale silt loam, 3 to 8 percent slopes. This moderately well drained, gently sloping soil is in valleys and on colluvial foot slopes in the Ouachita Mountains. Individual areas are 10 to 200 acres.

Typically, the surface layer is brown silt loam about 5 inches thick. The subsoil to a depth of about 27 inches is strong brown silt loam. The fragipan extends to about 49

part is red, mottled sandy clay loam. Below this is red and brown hard sandstone bedrock.

Included with this soil in mapping are a few intermin-
~~gled spots of Allen soils and spots where the surface~~

This soil has good potential for loblolly pine, sweetgum, and eastern cottonwood. Flooding limits the use of equip-
 ment in managing and harvesting the tree crop, but this
~~limitation can be overcome by logging during drier~~

layer is gravelly. These included spots make up less than 10 percent of this unit.

This soil is low in natural fertility. It is strongly acid to extremely acid throughout unless the surface layer has been limed. Permeability is moderate, and the available water capacity is medium. Runoff is medium. Tillage is easy to maintain.

Most of the acreage is pasture or meadow. Suitable pasture plants are bahiagrass, bermudagrass, white clover, sericea lespedeza, and annual lespedeza. Other suitable crops are corn, grain sorghum, soybeans, winter small grain, and truck crops. Grapes and fruit crops, such as peaches, apples, and pears are also suitable. Crops respond well to fertilization. Erosion is a severe hazard if cultivated crops are grown. Minimum tillage, contour farming, and the use of cover crops, including grasses and

seasons.

This soil has poor potential for urban use. Flooding, a severe limitation, can be overcome only by major flood control measures. Capability unit IVw-1; woodland suitability group 1w8; pasture and hayland group 2A.

17—Ouachita-Amy complex, frequently flooded. This deep, nearly level, well drained and poorly drained unit is on flood plains along drainageways in the Coastal Plain. Slopes are 0 to 2 percent. Individual areas range from 50 to 300 acres. These soils were so intricately mixed that it was not practical to map them separately at the scale selected for mapping.

Ouachita silt loam makes up about 55 percent of each mapped area. Typically, the surface layer is brown silt loam about 11 inches thick. The subsoil is yellowish brown silt loam to a depth of 26 inches. The lower part is dark

18—Saffell gravelly fine sandy loam, 3 to 8 percent slopes. This well drained, gently sloping soil is on uplands of the Coastal Plain. Individual areas are 40 to 300 acres.

Typically, the surface layer is brown gravelly fine sandy loam about 4 inches thick. The subsoil to a depth of about 9 inches is reddish brown gravelly fine sandy loam.

This soil is low in natural fertility and available water capacity. Reaction is strongly acid or very strongly acid unless the surface layer has been limed. Permeability is moderate and runoff is medium.

Urban land makes up 20 to 65 percent of the unit. It consists of Saffell soils and other soils that have been so altered or so obscured by buildings or other urban struc-

This soil has fair potential for most urban uses. Low strength is a moderate limitation for roads and streets. Moderately slow permeability is a severe limitation for septic tank absorption fields. These limitations are difficult to overcome. Capability unit IIw-1; woodland suitability group 3o7; pasture and hayland group 8A.

21—Savannah-Urban land complex, 1 to 3 percent slopes. This moderately well drained, nearly level map unit consists of Savannah soils and land modified by urban development that is mainly Savannah soil material. It occurs in the town of Benton and in urban areas in the south half of Saline County. Most areas range from 20 to 250 acres. Slopes range from 1 to 3 percent but average less than 2 percent. The areas of Savannah soils and Urban land were so intricately mixed that it was not feasible to map them separately at the scale selected for mapping.

Savannah soils make up about 25 to 65 percent of this map unit. Typically, the surface layer is brown fine sandy loam about 8 inches thick. The subsurface layer is yellowish brown fine sandy loam about 6 inches thick. The subsoil is yellowish brown loam to a depth of about 32 inches; compact and brittle, brownish yellow and yellowish brown mottled loam to about 55 inches; and mottled yellow, brown, and gray sandy clay loam that is also compact and brittle and extends to 72 inches or more.

The Savannah soil is low in natural fertility. It is strongly acid or extremely acid throughout unless the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. The available water capacity is medium. Runoff is medium and erosion is a moderate hazard unless the soil is protected by vegetation. The fragipan restricts the penetration of roots.

Urban land makes up 25 to 70 percent of the unit. It consists of Savannah soils and other soils that have been so altered or so obscured by buildings or other structures that identifying the soil is impossible. Typical structures are single- and multiple unit dwellings, streets, and roads.

The remaining 5 to 10 percent of the unit is a few intermingled areas of Smithdale and Tiak soils. In some areas, the Savannah soil has not been altered but is covered by 6 to 24 inches of loamy material.

This map unit has medium potential for most urban uses. Wetness is a moderate limitation for dwellings and industrial sites. Low strength is a moderate limitation for roads and streets. These limitations can usually be overcome with proper engineering design. Moderately slow permeability is a severe limitation for septic tank absorption fields. This limitation is difficult to overcome. The potential is medium for lawn grasses, shrubs, and trees. During wet periods the seasonal high water table is within the root zone. This limitation can be overcome by selecting plants that tolerate wetness and planting during drier seasons. Savannah soil in capability unit IIw-1; woodland suitability group 3o7; pasture and hayland group 8A. Urban land not assigned to interpretive groups.

22—Savannah fine sandy loam, 3 to 8 percent slopes. This moderately well drained, gently sloping soil is on uplands of the Coastal Plain. Individual areas are 10 to 300 acres.

Typically, the surface layer is brown fine sandy loam about 8 inches thick. The subsurface layer is yellowish brown fine sandy loam about 6 inches thick. The subsoil is yellowish brown loam to a depth of about 32 inches; brownish yellow and yellowish brown, mottled, compact and brittle loam to about 55 inches; and mottled yellow, brown, and gray, compact and brittle sandy clay loam that extends to 72 inches or more.

Included with this soil in mapping are a few intermingled spots of Smithdale and Tiak soils. Spots of these soils make up less than 10 percent of the unit.

This soil is low in natural fertility. Reaction ranges from strongly acid to extremely acid throughout unless the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. The available water capacity is medium, and runoff is medium. Tillage is easy to maintain. The fragipan restricts the penetration of roots.

This soil has fair potential for farming. Suitable crops are cotton, soybeans, and small grains. Crops respond well to fertilization. Erosion is a severe hazard if cultivated crops are grown. Minimum tillage, contour farming, and the use of cover crops, including grasses and legumes in the cropping system, help to reduce runoff and control erosion. This soil has fair potential for forage plants, such as bermudagrass, bahiagrass, tall fescue, white clover, and annual lespedeza.

This soil has fair potential for loblolly pine, shortleaf pine, and southern red oak. There are no significant limitations in woodland use or management.

This soil has fair potential for most urban uses. Wetness is a moderate limitation for dwellings and industrial sites. Low strength is a moderate limitation for roads and streets. Moderately slow permeability is a severe limitation for septic tank absorption fields. All are difficult to overcome. Capability unit IIIe-4; woodland suitability group 3o7; pasture and hayland group 8A.

23—Savannah-Urban land complex, 3 to 8 percent slopes. This moderately well drained, gently sloping map unit consists of Savannah soils and land modified by urban development that is mainly Savannah soil material. It occurs in the town of Benton and in urban areas in the south half of Saline County. Most areas range from 20 to 250 acres. Slopes range from 3 to 8 percent. The areas of Savannah soils and Urban land were so intricately mixed that it was not feasible to map them separately at the scale selected for mapping.

Savannah soils make up about 25 to 60 percent of this map unit. Typically, the surface layer is brown fine sandy loam about 8 inches thick. The subsurface layer is yellowish brown fine sandy loam about 6 inches thick. The subsoil is yellowish brown loam to a depth of about 32 inches; compact and brittle, brownish yellow and yellowish brown mottled loam to about 55 inches; and mot-

tled yellow, brown, and gray sandy clay loam that is also compact and brittle and extends to 72 inches or more.

The Savannah soil is low in natural fertility. It is strongly acid or extremely acid unless the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. The available water capacity is medium. Runoff is medium and erosion is a severe hazard unless the soil is pro-

This unit has poor potential for farming. Large stones and the depth to bedrock are severe limitations that are very difficult to overcome.

Potential is poor for locally grown trees. Most of the acreage is in scrub mixed upland oaks. The use of logging equipment is restricted because of large stones and rock outcrop.

This unit has good potential as woodland wildlife habitat (fig 6) and extensive recreation areas. It has fair



Urban land makes up 25 to 70 percent of the unit. It consists of Savannah soils and other soils that have been so altered or so obscured by buildings or other structures

for dwellings, small commercial buildings, and streets and roads. They can usually be overcome with proper engineering design. Sherwood soil in capability unit IVE-1.

ment that is mainly Smithdale soil material. It occurs in available water capacity is high. Runoff is rapid. Till is

of Saline County. Most areas range from 20 to 150 acres. Slopes range from 3 to 8 percent. The areas of Smithdale soils and Urban land were so intricately mixed that it was not feasible to map them separately at the scale selected for mapping.

Smithdale soils make up about 25 to 65 percent of this map unit. Typically, the surface layer is yellowish brown loamy sand about 6 inches thick. The subsoil is strong brown fine sandy loam to a depth of about 15 inches; yellowish red and red, mottled sandy clay loam and fine sandy loam to about 102 inches; and red loamy fine sand to about 111 inches. The underlying material is yellowish red loamy fine sand that extends to 123 inches or more.

The Smithdale soil is moderate in natural fertility. It is strongly acid or very strongly acid throughout unless the surface layer has been limed. Permeability is moderate, and the available water capacity is high. Runoff is medium and erosion is a severe hazard unless the soil is protected by vegetation.

Urban land makes up 25 to 70 percent of the unit. It consists of Smithdale soils and other soils that have been so altered or so obscured by buildings or other structures that identifying the soil is impossible. Typical structures are single- and multiple-unit dwellings, streets, and roads.

The remaining 5 to 10 percent of the unit is a few intermingled areas of Savannah, Saffell, and Tiak soils, and spots where slopes are greater than 8 percent.

This unit has good potential for most urban uses. Limitations are slight for dwellings, roads and streets, and septic tank absorption fields. Slope is a moderate

This soil has poor potential for farming. Suitable pasture plants are bermudagrass, bahiagrass, and tall fescue. Erosion is a severe hazard if cultivated crops are grown. Minimum tillage, contour farming, and the use of cover crops, including grasses and legumes in the cropping system, help to reduce runoff and control erosion.

Most areas are woodland. The soil has fair potential for loblolly pine. There are no significant limitations in woodland use or management.

This soil has fair potential for most urban uses. Slope is a moderate limitation for dwellings, local roads and streets, and septic tank absorption fields and a severe limitation for industrial sites. This limitation can usually be overcome with proper engineering design. Capability unit IVE-2; woodland suitability group 301; pasture and hayland group 9A.

28—Smithdale and Darco loamy sands, 12 to 30 percent slopes. This unit consists of well drained, steep soils on uplands of the Coastal Plain. It consists of irregular patterns of Smithdale loamy sand and Darco loamy fine sand. Most mapped areas contain both soils, but a few contain only one. Individual areas were large enough to be mapped separately, but such mapping was not warranted because of the low intensity of use and management. Slopes range from 12 to 30 percent. Individual areas range from 40 to 300 acres.

Typically, the Smithdale soil has a yellowish brown loamy sand surface layer about 6 inches thick. The subsoil

This unit has fair potential for loblolly pine and short-leaf pine. There are no significant limitations in woodland use or management.

This unit has low potential for most urban uses. Slope is a severe limitation for dwellings, local roads and streets, septic tank absorption fields, and industrial sites. This limitation is difficult or impractical to overcome. Smithdale soil in capability unit VIe-2, woodland suitability group 3o1, pasture and hayland group 9A; Darco soil in capability unit VIe-1, woodland suitability group 4s3, pasture and hayland group 9A.

29—Tiak silt loam, 3 to 8 percent slopes. This deep, moderately well drained, gently sloping soil is on uplands of the Coastal Plain. Individual areas are 20 to 200 acres.

Typically, the surface layer is brown silt loam about 7 inches thick. The subsurface layer is light yellowish brown loam about 5 inches thick. The subsoil is red clay to a depth of about 22 inches; red, mottled clay to about 32 inches; red and gray, mottled clay to about 53 inches; light gray, mottled clay to 64 inches; and gray and red, mottled sandy clay loam that extends to 72 inches or more.

Tiak soils make up about 25 to 60 percent of this map unit. Typically, the surface layer is brown silt loam about 7 inches thick. The subsurface layer is light yellowish brown loam about 5 inches thick. The subsoil is red clay to a depth of about 22 inches; red, mottled clay to about 32 inches; red and gray, mottled clay to about 53 inches; light gray, mottled clay to 64 inches; and gray and red, mottled sandy clay loam that extends to 72 inches or more.

The Tiak soil is low in natural fertility. It is very strongly acid throughout unless the surface layer has been limed. Permeability is slow and the available water capacity is high. Runoff is medium and erosion is a severe hazard unless the soil is protected by vegetation.

Urban land makes up 25 to 70 percent of the unit. It consists of Tiak soils and other soils that have been so altered or so obscured by buildings or other structures that identifying the soil is impossible. Typical structures are single and multiple unit dwellings, streets, and roads.

light gray, mottled clay to 64 inches; and mottled gray, red, and yellowish red sandy clay loam that extends to 72 inches or more.

The remaining 5 to 15 percent is a few intermingled areas of Savannah and Smithdale soils and spots where slopes are greater than 8 percent.

This soil has fair potential for loblolly pine and short-leaf pine. There are no significant limitations in woodland use and management.

This soil has poor potential for most urban uses. Shrink-swell and low strength are severe limitations for dwellings, industrial sites, and roads and streets. Slow percolation is a severe limitation for septic tank absorption fields. These limitations are difficult to overcome. Capability unit VIe-3; woodland suitability group 3c2; pasture and hayland group 8C.

32—Udorthents. This map unit consists of bauxite pits and abandoned pits and nearly level to very steep areas of mine spoil of excavated material. The pits are long, open excavations from which soil and the underlying material have been removed. Slopes range from 3 to 60 percent. Individual areas are about 50 to 200 acres.

This unit is about 40 percent bauxite pits that are actively mined. About 50 percent is areas of mine spoil. A few areas are planted to pine trees, and a few are experimental grass plots. The remaining 10 percent is small areas of Smithdale and Savannah soils.

Udorthents are excessively drained soils that have been altered or obscured by mining operations. Soil classification is impractical. The surface layer ranges from very fine sandy loam to gravelly fine sandy loam. The underlying material ranges from gravelly loamy sand to very gravelly silty clay loam.

Permeability is moderately rapid. Fertility and the organic matter content are extremely low. The available water capacity is low. The soil material is extremely acid to moderately alkaline in the A horizon and extremely acid or very strongly acid in the underlying material.

This unit is not suited to cultivated crops. If reclaimed, it would have fair potential for grasses and eastern redcedar.

Udorthents have poor potential for most urban uses. Areas where slopes are 8 to 12 percent have moderate limitations and areas where slopes are more than 15 percent have severe limitations for dwellings, roads and streets, and septic tank absorption fields. Capability unit VIIIs-1; woodland suitability group 5r9; pasture and hayland group 8R

extremely acid unless the surface layer has been limed. Permeability is very slow, and runoff is slow. The water table is seasonally high. It is within 12 inches of the surface in winter and early in spring.

Most of the acreage is woodland. Some cleared areas are pasture. Suitable pasture plants are bermudagrass, bahiagrass, tall fescue, white clover, annual lespedeza, and sericea lespedeza. Lime and fertilization improve stands and yields. In areas where surface drainage is adequate, suitable cultivated crops are soybeans and winter small grain.

This soil has fair potential for loblolly pine and sweetgum. Wetness is the main limitation in the use of equipment in managing and harvesting the tree crop. Usually this limitation can be overcome by logging during the drier seasons.

This soil has poor potential for most urban uses. Poor drainage and the seasonal high water table are severe limitations for dwellings, streets, and industrial sites. The very slow permeability and the seasonal high water table are severe limitations for septic tank absorption fields. These limitations are difficult or impractical to overcome. Capability unit IIIw-2; woodland suitability group 3w9; pasture and hayland group 7C.

34—Zafra-Leadvale complex, 3 to 8 percent slopes. This unit consists of small areas of Zafra soils and Leadvale soils in such an irregular pattern that they could not be mapped separately at the scale selected for mapping. Individual areas range from 50 to 300 acres.

Zafra loam makes up about 45 percent of each mapped area. Typically, the surface layer is dark brown loam about 8 inches thick. The subsoil extends to a depth of about 40 inches. The upper part is yellowish red gravelly clay loam, the next layer is yellowish red very gravelly clay loam, and the lower part is strong brown very gravelly clay loam. Below this is hard shale bedrock.

This soil is low in natural fertility. Reaction is medium acid or strongly acid. Permeability is moderate, and the available water capacity is medium to high.

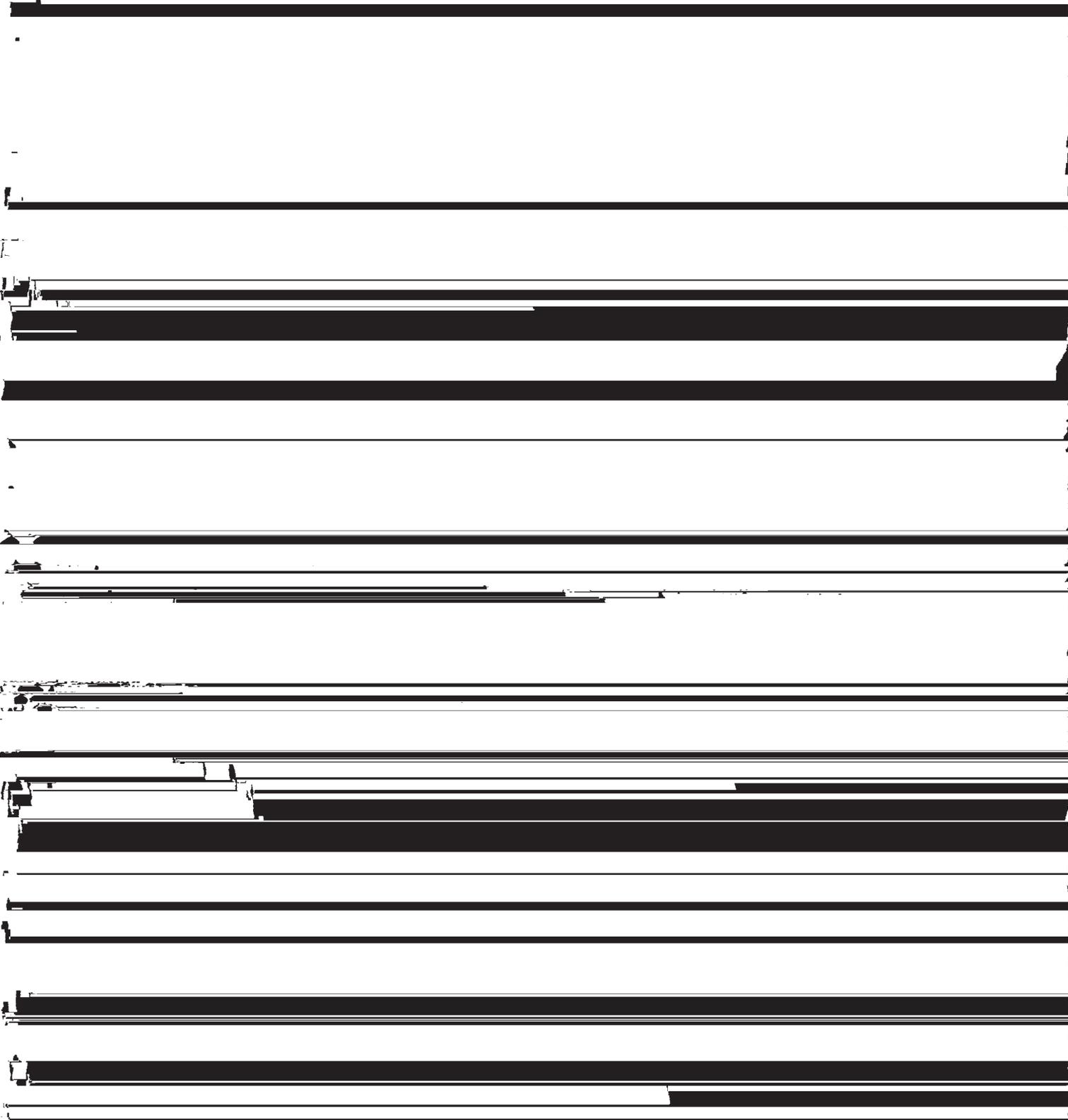
Leadvale silt loam makes up about 30 percent of each mapped area. Typically, the surface layer is brown silt loam about 5 inches thick. The subsoil is dark brown

fescue, white clover, sericea lespedeza, and annual lespedeza.

This unit has fair potential for most urban uses. On the

information indicates the presence of bedrock, wetness, or very firm soil horizons that cause difficulty in excavation.

Health officials, highway officials, engineers, and many other specialists also can find useful information in this



Crop residue should be shredded and spread evenly to provide protective cover and organic matter to the soils.

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

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

Perennial grasses or legumes or a mixture is grown for pasture and hay. Generally, the mixture consists of either a summer or a winter perennial grass and a suitable legume.

Coastal bermudagrass and common bermudagrass, dallisgrass, and Pensacola bahiagrass are the summer perennials most commonly grown. Coastal bermudagrass and Pensacola bahiagrass are fairly new to this county, but both are highly satisfactory in production of good quality forage. Tall fescue, the chief winter perennial grass now grown, grows well only on soils that have a favorable soil-moisture relationship. 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 production, stand survival, and erosion control. Other treatments and management practices, for example brush and weed control, fertilization, and renovation of the pasture, are also important.

The soils of Saline County have been assigned to nine pasture and hayland groups. These groups are prepared to assist land users in selecting and managing suitable forage plants. The soils included in each group grow similar kinds of forage plants and require similar treatment and management. Forage production on all soils in the group is essentially the same if management and treatment are the same. The pasture and hayland groups are identified in the description of each soil map unit under the heading "Soil maps for detailed planning." The local office of the Soil Conservation Service can provide additional information about these groups.

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

and available yield data from nearby counties were also considered.

The yields were estimated assuming that the latest soil and crop management practices were used. Hay and pasture yields were estimated for the most productive varieties of grasses and legumes suited to the climate and the soil. A few farmers may be obtaining average yields higher than those shown in table 7.

The management needed to achieve the indicated yields of the various crops depends on the kind of soil and the crop. Such management provides drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate tillage practices, including time of tillage and seedbed preparation and tilling when soil moisture is favorable; 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 residues, barnyard manure, and green-manure crops; harvesting crops with the smallest possible loss; and timeliness of all fieldwork.

The estimated yields reflect the productive capacity of the soils 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 included because the acreage of these crops is small. The local offices of the Soil Conservation Service and the Cooperative Extension Service can provide information about the management concerns and productivity of the soils for these crops.

Capability classes and subclasses

Capability classes and subclasses show, in a general way, the suitability of soils for most kinds of field crops. The soils are classed according to their limitations when they are used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops that require special management. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forest trees, or for

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

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

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

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them

loblolly pine, shortleaf pine, southern red oak, black oak, white oak, hickory, ash, and sweetgum.

Forest covers about 372,600 acres, or 80 percent of the land area (6) in Saline County. In recent years, there has been a trend toward converting woodland to urban uses. This trend is expected to continue.

Table 8 contains information useful to woodland owners or forest managers planning use of soils for wood crops. Map unit symbols for soils suitable for wood crops are listed, and the woodland suitability group symbol for each soil is given. All soils bearing the same woodland suitability group symbol require the same general kinds of woodland management and have about the same potential

for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree that the soil affects expected mortality of planted tree seedlings. Plant competition is not considered in the ratings. Seedlings from good planting stock that are properly planted during a period of sufficient rainfall are rated. A rating of *slight* indicates that the expected mortality of the planted seedlings is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

The *potential productivity* of merchantable or *important trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Site index ratings are based on age 30 for eastern cottonwood, age 35 for American sycamore, and age 50 for all other species. Important 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 suitable for commercial wood production and that are suited to the soils.

Engineering

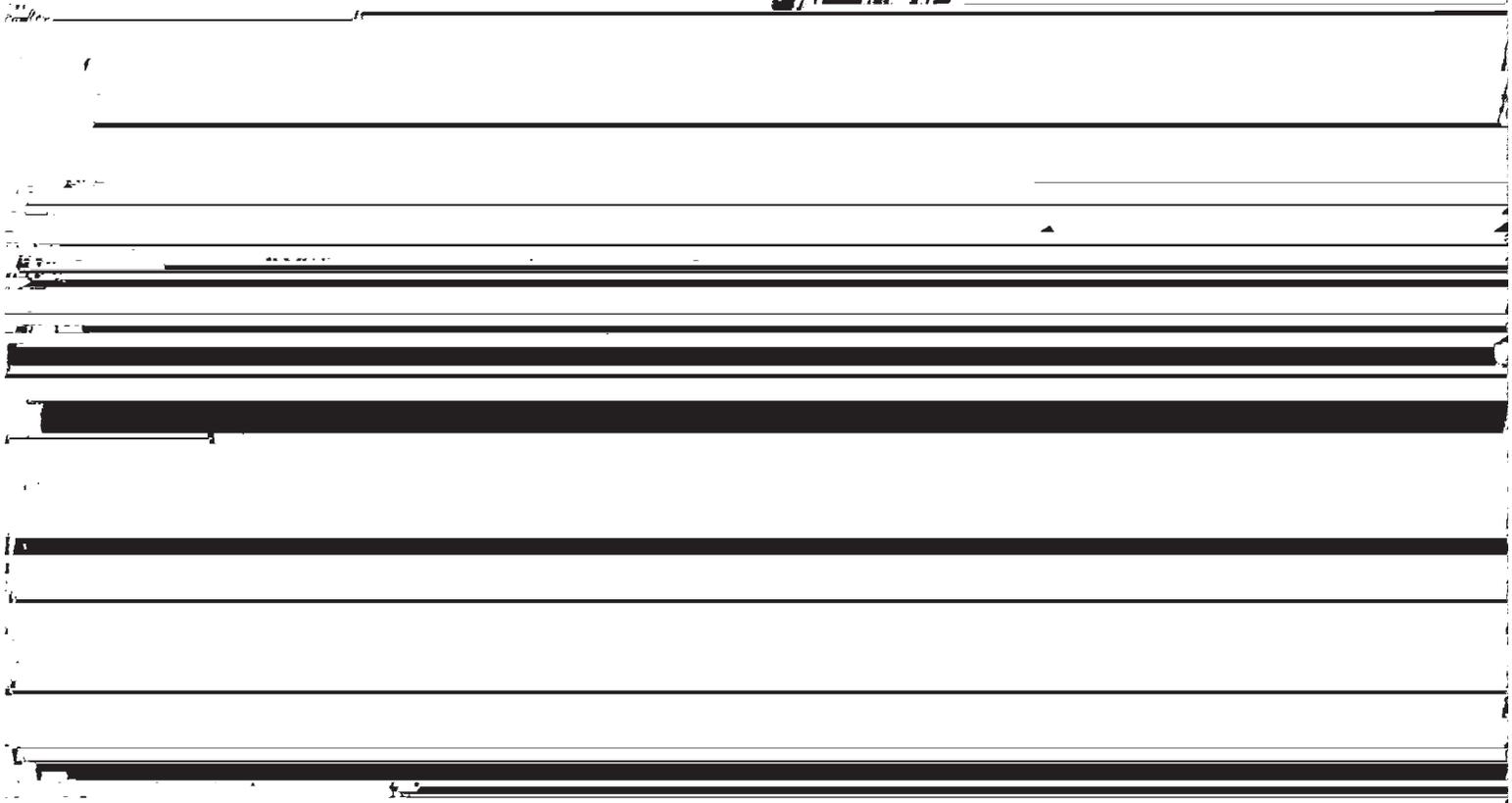
JAMES L. JANSK, civil engineer, and RAYMOND INGRAM, design engineer, Soil Conservation Service, helped prepare this section.

This section provides information about the use of soils for building sites, sanitary facilities, construction material,

plied to each major horizon of each soil or to the entire profile.

These factors of soil behavior affect construction and maintenance of roads, airport runways, pipelines, foundations for small buildings, ponds and small dams, irrigation projects, drainage systems, sewage and refuse disposal systems, and other engineering works. The ranges of values can be used to (1) select potential residential, commercial, industrial, and recreational uses; (2) make preliminary estimates pertinent to construction in a particular area; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for location of sanitary landfills, onsite sewage disposal systems, and other waste disposal facilities; (5) plan detailed onsite investigations of soils and geology; (6) find sources of gravel, sand, clay, and topsoil; (7) plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; (8) relate performance of structures already built to the properties of the kinds of soil on which they are built so that performance of similar structures on the same or a similar soil in other locations can be predicted; and (9) predict the trafficability of soils for cross-country movement of vehicles and construction equipment.

Data presented in this section are useful for land-use planning and for choosing alternative practices or general designs that will overcome unfavorable soil properties and minimize soil-related failures. Limitations to the use of these data, however, should be well understood. First, the data are generally not presented for soil



soil properties generally are favorable for the specified use; any limitation is minor and easily overcome. A *moderate* limitation indicates that soil properties and site features are unfavorable for the specified use, but the limitations can be overcome or minimized by special planning and design. A *severe* limitation indicates that one or more soil properties or site features are so unfavorable or difficult to overcome that a major increase in construction effort, special design, or intensive maintenance is required. For some soils rated severe, such costly measures may not be feasible.

Shallow excavations are made for pipelines, sewerlines, communications and power transmission lines, basements, and open ditches. Such digging or trenching is influenced by soil wetness caused by a seasonal high water table; the texture and consistence of soils; the tendency of soils to cave in or slough; and the presence of very firm, dense soil layers, bedrock, or large stones. In addition, excavations are affected by slope of the soil and the probability of flooding. Ratings do not apply to soil horizons below a depth of 6 feet unless otherwise noted.

In the soil series descriptions, the consistence of each soil horizon is given, and the presence of very firm or extremely firm horizons, usually difficult to excavate, is indicated.

Dwellings and *small commercial buildings* referred to in table 9 are built on undisturbed soil and have foundation loads of a dwelling no more than three stories high.

frost action are indicators of the traffic supporting capacity used in making the ratings. Soil wetness, flooding, slope, depth to hard rock or very compact layers, and content of large stones affect stability and ease of excavation.

Sanitary facilities

Favorable soil properties and site features are needed for proper functioning of septic tank absorption fields, sewage lagoons, and sanitary landfills. The nature of the soil is important in selecting sites for these facilities and in identifying limiting soil properties and site features to be considered in design and installation. Also, those soil properties that affect ease of excavation or installation of these facilities will be of interest to contractors and local officials. Table 10 shows the degree and kind of limitations of each soil for such uses and for use of the soil as daily cover for landfills. It is important to observe local ordinances and regulations.

If the degree of soil limitation is expressed as *slight*, soils are generally favorable for the specified use and limitations are minor and easily overcome; if *moderate*, soil properties or site features are unfavorable for the specified use, but limitations can be overcome by special planning and design; and if *severe*, soil properties or site features are so unfavorable or difficult to overcome that major soil reclamation, special designs, or intensive maintenance is required. Soil suitability is rated by the terms

system to lower the seasonal water table can be installed or the size of the absorption field can be increased so that performance is satisfactory.

ganic matter, and the best potential for growing plants. Thus, for either the area- or trench-type landfill, stockpiling material from the A horizon for use as the surface

sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons have a nearly level floor and cut slopes or embankments of compacted soil material. Aerobic lagoons generally are designed to hold 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. Soils that are very high in content of organic matter and those that have cobbles, stones, or boulders are not suitable. Unless the soil has very slow permeability, contamination of ground water is a hazard where the seasonal high water table is above the level of the lagoon floor. In soils where the water table is seasonally high, seepage of ground water into the lagoon can seriously reduce the lagoon's capacity for liquid waste. Slope, depth to bedrock, and susceptibility to flooding also affect the suitability of sites for sewage lagoons or the cost of construction. Shear strength and permeability of compacted soil material affect the performance of embankments

Where it is necessary to bring in soil material for daily or final cover, thickness of suitable soil material available and depth to a seasonal high water table in soils surrounding the sites should be evaluated. Other factors to be evaluated are those that affect reclamation of the borrow areas. These factors include slope, erodibility, and potential for plant growth.

Construction materials

The suitability of each soil as a source of roadfill, sand, gravel, and topsoil is indicated in table 11 by ratings of good, fair, or poor. The texture, thickness, and organic-matter content of each soil horizon are important factors in rating soils for use as construction materials. Each soil is evaluated to the depth observed, generally about 6 feet.

Roadfill is soil material used in embankments for roads. Soils are evaluated as a source of roadfill for low embankments, which generally are less than 6 feet high

The ratings do not take into account depth to the water table or other factors that affect excavation of the material. Descriptions of grain size, kinds of minerals, reaction, and stratification are given in the soil series descriptions and in table 15.

are so unfavorable and so difficult to correct or overcome that major soil reclamation, special design, or intensive maintenance is required.

Topsoil is used in areas where vegetation is to be established and maintained. Suitability is affected mainly

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have a low seepage potential, which is determined by permeability and the depth to fractured or permeable bedrock or other

by the ease of working and spreading the soil material in preparing a seedbed and by the ability of the soil material to support plantlife. Also considered is the damage that can result at the area from which the topsoil is taken.

permeable material.

The ease of excavation is influenced by the thickness of suitable material, wetness, slope, and amount of stones. The ability of the soil to support plantlife is determined by texture, structure, and the amount of soluble salts or toxic substances. Organic matter in the A1 or Ap horizon

Embankments, dikes, and levees require soil material that is resistant to seepage, erosion, and piping and has favorable stability, shrink-swell potential, shear strength, and compaction characteristics. Large stones and organic matter in a soil downgrade the suitability of a soil for use in embankments, dikes, and levees.

Aquifer-fed excavated ponds are bodies of water made by excavating a pit or dugout into a ground-water

of the area, size and shape of the area and its scenic quality, the ability of the soil to support vegetation, access to water, potential water impoundment sites available, and either access to public sewerlines or capacity of the soil to absorb septic tank effluent. Soils subject to flooding are limited, in varying degree, for recreation use by the duration and intensity of flooding and the season when flooding occurs. Onsite assessment of height, duration, intensity, and frequency of flooding is essential in planning recreation facilities.

The degree of the limitation of the soils is expressed as slight, moderate, or severe. *Slight* means that the soil properties are generally favorable and that the limitations are minor and easily overcome. *Moderate* means that the 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 13 can be supplemented by information in other parts of this survey. Especially helpful are interpretations for septic tank absorption fields, given in table 10, and interpretations for dwellings without basements and for local roads and streets, given in table 9.

Camp areas require such site preparation as shaping and leveling for 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 for this use 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 camping sites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for use as 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 will 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 or boulders, is firm after rains, and is not dusty when dry. If shaping is required to obtain a uniform grade, the depth of the soil over bedrock or hardpan should be enough to allow necessary grading.

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

Wildlife habitat

ROY A. GRIZZELL, JR., biologist, Soil Conservation Service, helped prepare this section.

Soils are related to the kinds and abundance of wildlife through the vegetation they support and the habitat the vegetation provides. Desirable habitat depends on the diversity of food, cover, and nearness of vegetation to water. The kind and amount of vegetation is closely related to soil characteristics and land use.

All wildlife and fish respond to the basic characteristics of soils. This response is affected in many ways by fertility, slope, wetness, and other characteristics of soils. The permeability rate determines whether or not the soil can be used to impound water in ponds and lakes.

Extensive wooded areas, such as the Saline River bottom land, are well suited as habitat for deer, wild turkey, squirrel, and other woodland wildlife. These areas and similar ones on private land provide suitable food, cover, and drinking water for wildlife if they are not unduly disturbed.

Soils directly affect the kind and amount of vegetation that is available to wildlife as food and cover, and they affect the construction of water impoundments. The kind and abundance of wildlife that populate an area depend largely on the amount and distribution of food, cover, and water. If any one of these elements is missing, is inadequate, or is inaccessible, wildlife either are scarce or do not inhabit the area.

If the soils have the potential, wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by helping the natural establishment of desirable plants.

In table 14, the soils in the survey area are rated according to their potential to support the main kinds of wildlife habitat in the area. This information can be used in planning for parks, wildlife refuges, nature study areas, and other developments for wildlife; selecting areas that are suitable for wildlife; selecting soils that are suitable for creating, improving, or maintaining specific elements of wildlife habitat; and 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* means that the element of wildlife habitat or the kind of habitat is easily created, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected if the soil is used for the designated purpose. A rating of *fair* means that the element of wildlife habitat or kind of habitat can be created, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* means that limitations are severe for the designated element or kind of wildlife habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* means that restrictions for the element of wildlife habitat or kind of wildlife are very severe, and that unsatisfactory results

can be expected. Wildlife habitat is impractical or even impossible to create, improve, or maintain on soils having such a rating.

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

Grain and seed crops are seed-producing annuals used by wildlife. The major soil properties 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, grain sorghum, wheat, and millet.

Grasses and legumes are domestic perennial grasses and herbaceous legumes that are planted for wildlife food and cover. Major soil properties 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 bahiagrass, bermudagrass, panic grass, and clover.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds, that pro-

Shallow water areas are bodies of water that have an average depth of less than 5 feet and that are useful to wildlife. They can be naturally wet areas, or they can be created by dams or levees or by water-control structures in marshes or streams. Major soil properties affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. The availability of a dependable water supply is important if water areas are to be developed. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The kinds of wildlife habitat are briefly described in the following paragraphs.

Openland habitat 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 kinds of wildlife attracted to these areas include bobwhite quail, doves, meadowlark, and cottontail rabbit.

Woodland habitat consists of areas of hardwoods or conifers, or a mixture of both, and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, thrushes, woodpeckers

The available field and laboratory data are summarized in tables. The tables give the estimated range of engineering properties, the engineering classifications, and the physical and chemical properties of each major horizon of each soil in the survey area. They also present data about pertinent soil and water features, engineering test data, and data obtained from physical and chemical laboratory analyses of soils.

Engineering properties

Table 15 gives estimates of engineering properties and classification for the various horizons of each soil in the

When laboratory data are available, the A-1, A-2, and A-7 groups are further classified as follows: A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, and A-7-6. As an additional refinement, the desirability of soils as subgrade material can be indicated by a group index number. These numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested in the survey area, with group index numbers in parentheses, is given in table 20. The estimated classification, without group index numbers, is given in table 15. Also in table 15 the percentage, by weight, of rock fragments more than 3 inches in diameter is esti-

the available water from the deeper soil horizons. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design of irrigation systems.

Soil reaction is expressed as a range in pH values. The range in pH of each major horizon is based on many field checks. For many soils, the values have been verified by laboratory analyses. Soil reaction is important in selecting the crops, ornamental plants, or other plants to be grown; in evaluating soil amendments for fertility and stabilization; and in evaluating the corrosivity of soils.

soil-loss tolerance factor (T) is the maximum rate of soil erosion, whether from rainfall or soil blowing, that can occur without reducing crop production or environmental quality. The rate is expressed in tons of soil loss per acre per year.

Soil and water features

Table 17 contains information helpful in planning land uses and engineering projects that are likely to be affected by soil and water features.

Hydrologic soil groups are used to estimate runoff

The generalized description of flood hazards is of value in land-use planning and provides a valid basis for land-use restrictions. The soil data are less specific, however, than those provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table is the highest level of a saturated zone more than 6 inches thick for a continuous period of more than 2 weeks during most years. The depth to a seasonal high water table applies to undrained soils. Estimates are based mainly on the relationship between grayish colors or mottles in the soil and the depth to free water observed in many borings made during the course of the soil survey. 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. Only

In Saline County, soils representing two soil series were selected for laboratory analyses. Profiles of these soils are described under "Soil series and morphology." The analyses were made by the University of Arkansas in Fayetteville. Tables 18 and 19 show the results.

Silt and clay particle size distribution was determined by the hydrometer method (3). Sands were measured by sieving (5).

Organic matter was determined by a modified Walkley-Black method. The organic matter is digested with potassium dichromate-sulfuric acid and the quantity of chromic acid reduced is measured colorimetrically.

Soil pH was determined on 1:1 soil to water mixture. Available phosphorus was extracted with the Bray No. 1 solution (0.03N ammonium fluoride and 0.025N hydrochloric acid) and measured colorimetrically.

The bases were extracted with 1N. nH₄O. ammonium

Allen series

The Allen series consists of well drained, deep,

Amy soils are geographically associated with Savannah, Ouachita, Smithdale, and Wrightsville soils. The nearly level to gently sloping Savannah soils are on uplands.

weathered from sandstone. These steep soils are on mountainsides. The native vegetation is mixed pines and hardwoods. Slopes are 20 to 40 percent.

Allen soils are geographically associated with Linker and Smithdale soils. The gently sloping Linker soils are on mountaintops. They are shallower than Allen soils. The gently sloping to moderately sloping Smithdale soils are on uplands of the Coastal Plain. They are less clayey in the lower part of the B horizon than Allen soils.

Typical pedon of Allen loam in moist wooded area of Allen loam, 20 to 40 percent slopes, SE1/4SE1/4NW1/4 sec. 30, T. 1 S., R. 13 W.:

A1—0 to 4 inches: very dark grayish brown (10YR 3/2) loam; weak fine

Ouachita soils are on flood plains. They lack an argillic horizon and are better drained than Amy soils. The gently sloping to moderately sloping Smithdale soils are on uplands. They are well drained. The level to depressional Wrightsville soils are on old stream terraces. They have more clay throughout the B horizon than the Amy soils.

Typical pedon of Amy silt loam in moist wooded area of Amy silt loam, frequently flooded, SW1/4SE1/4SE1/4 sec. 34, T. 2 S., R. 15 W.:

A1—0 to 3 inches; grayish brown (10YR 5/2) silt loam; common fine distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable; common fine roots; few fine pores; very strongly acid; clear smooth boundary.

Typical pedon of Angie fine sandy loam in wooded area of Angie fine sandy loam, 3 to 8 percent slopes, SE1/4SE1/4SW1/4 sec. 25, T. 2 S., R. 12 W.:

- A1—0 to 4 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; friable; many fine and medium roots; medium acid; clear smooth boundary.
- A2—4 to 10 inches; pale brown (10YR 6/3) fine sandy loam; moderate medium and coarse granular structure; friable; common fine and medium roots; medium acid; clear smooth boundary.
- B21t—10 to 19 inches; strong brown (7.5YR 5/6) heavy silty clay loam; moderate medium subangular blocky structure; friable; common roots; common pores; thin patchy clay films on faces of peds; extremely acid; gradual wavy boundary.
- B22t—19 to 25 inches; yellowish brown (10YR 5/6) silty clay; common medium distinct light brownish gray (10YR 6/2) and yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; friable; few roots; few pores; distinct patchy clay films on faces of peds; extremely acid; gradual wavy boundary.
- B23t—25 to 49 inches; mottled gray (10YR 6/1) clay; many medium distinct yellowish brown (10YR 5/8) and common medium prominent red (2.5YR 4/8) mottles; moderate medium subangular blocky structure; firm; few fine roots; common fine pores; patchy clay films on faces of peds; extremely acid; gradual wavy boundary.
- B24t—49 to 72 inches; mottled gray (10YR 6/1) and brownish yellow (10YR 6/8) clay; moderate coarse subangular blocky structure; firm; few patchy clay films on faces of peds; extremely acid.

- pores; 5 percent gravel 2 to 75 millimeters; thin patchy clay films on faces of some peds; strongly acid; clear wavy boundary.
- B22t—19 to 31 inches; red (2.5YR 5/8) clay loam; moderate medium subangular blocky structure; firm; many fine pores; few fine roots; 7 percent gravel 2 to 75 millimeters; patchy clay films on faces of most peds; very strongly acid; clear wavy boundary.
- B23t—31 to 56 inches; mottled red (2.5YR 4/8), strong brown (7.5YR 5/8), and brownish yellow (10YR 6/6) clay loam; moderate medium subangular blocky structure; friable; few fine pores; 12 percent gravel 2 to 75 millimeters; patchy clay films on most faces of peds; very strongly acid; gradual wavy boundary.
- B24t—56 to 72 inches; mottled red (2.5YR 4/8), yellowish red (5YR 5/8), strong brown (7.5YR 5/8), and light gray (10YR 7/2) very gravelly clay loam; moderate medium and coarse subangular blocky structure; friable; few fine pores; patchy clay films on most faces of peds and on gravel; 60 percent gravel 2 to 75 millimeters; very strongly acid.

Solum thickness ranges from 60 to 85 inches. Reaction is strongly acid to very strongly acid unless the surface layer has been limed.

The A horizon ranges from 2 to 14 inches in thickness. It has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. Some pedons have an A1 horizon that has hue of 10YR, value of 3, and chroma of 1 or 2.

The B21t horizon has hue of 7.5YR or 5YR, value of 4 to 6, and chroma of 4 to 8. Some pedons have a B1 horizon that is similar to the B2 horizon in color. The B22t and B23t horizons have hue of 5YR or 2.5YR, value of 4 to 6, and chroma of 4 to 8. Some pedons have a B3 horizon that is similar to the B2t horizon in color. Texture of the B21t, B22t, and B23t horizons is loam, clay loam, or sandy clay loam. Content

angular blocky structure; firm; 10 to 15 percent light gray (10YR 7/1) silt tongues; few fine roots; few fine pores; neutral; clear smooth boundary.

B3g—35 to 72 inches; gray (10YR 5/1) silty clay loam; common fine distinct yellowish brown (10YR 5/8) mottles; weak coarse subangular blocky structure; firm; few light gray (10YR 7/1) silt tongues tapering with depth; few fine roots; few fine pores; mildly alkaline.

Solum thickness ranges from 60 to 72 inches. Reaction is medium acid to strongly acid in the A horizon and upper part of the B horizon and slightly acid to mildly alkaline in the lower part of the B horizon.

The A horizon is dominantly about 10 inches thick, but in places it is less than 8 inches. The A1 horizon has hue of 10YR, value of 4 or 5, and chroma of 2. The A2 horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2.

The matrix of the B horizon has hue of 10YR, value of 5, 6, or 7; and chroma of 1 or 2 and has mottles in shades of brown and yellow. Texture is silt loam or silty clay loam.

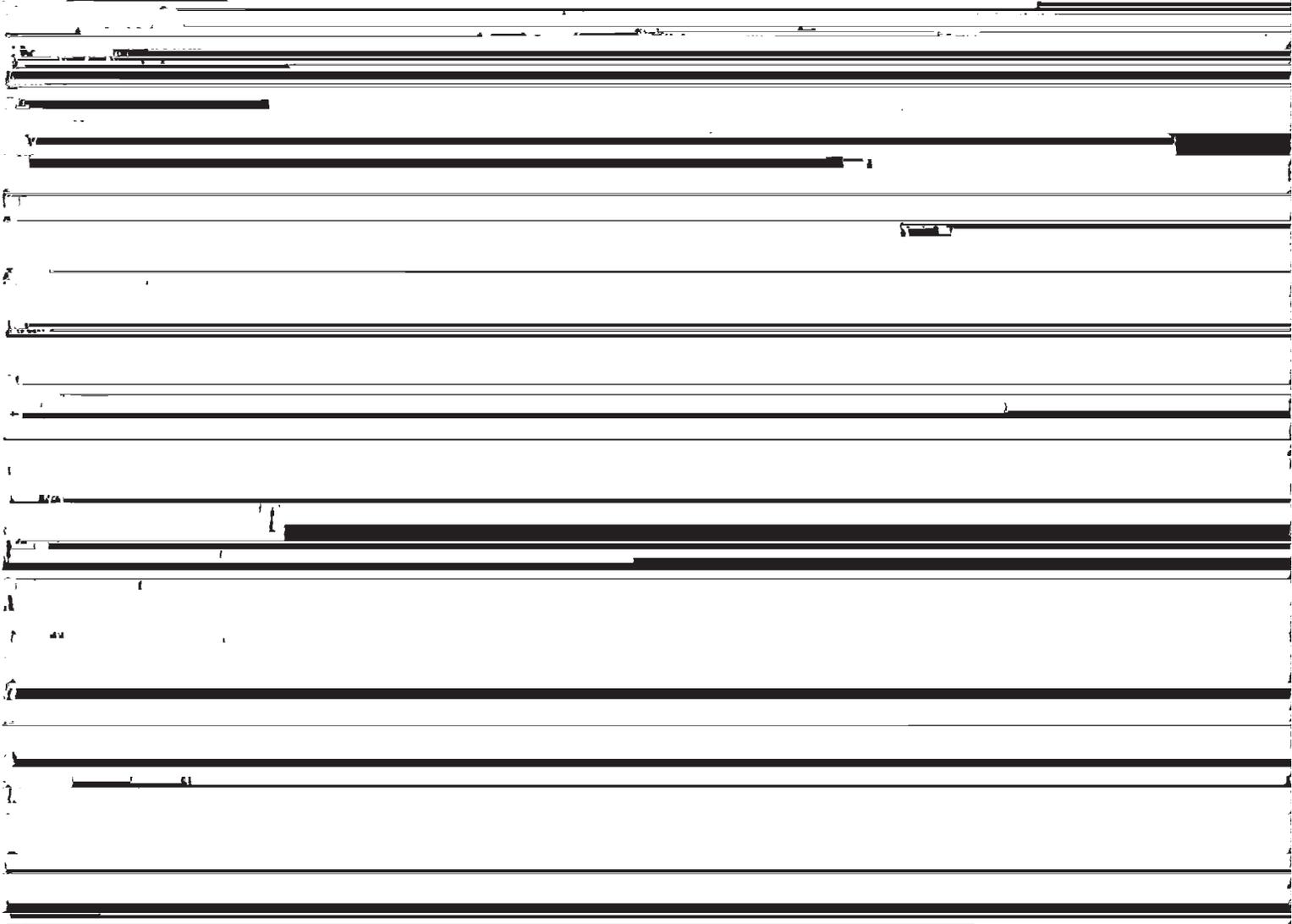
The Caddo Variant has a thinner A2 horizon than is typical for the Caddo series. Reaction ranges from medium acid in the upper part of the B horizon to mildly alkaline in the lower part. These soils are similar

B23t—21 to 29 inches; red (2.5YR 4/8) clay; common fine distinct brownish yellow (10YR 6/6) mottles; strong medium subangular blocky structure; firm; continuous clay films on faces of peds; few fine roots; few fine and medium pores; about 5 percent fragments of red and yellow shale; very strongly acid; gradual irregular boundary.

B24t—29 to 40 inches; red (2.5YR 4/8) silty clay; many coarse prominent yellowish red (5YR 5/6) mottles; strong coarse blocky structure; very firm; continuous clay films on faces of peds; few fine and medium roots; common fine pores; 10 percent relic fragments of gray shale; very strongly acid; gradual irregular boundary.

Cr—40 to 72 inches; mottled gray (10YR 6/1), red (2.5YR 4/8), and yellow (10YR 7/6) soft shale that rubs to clayey fine earth; layers of weathered shale tilted 30 to 40 degrees from horizontal gives appearance of medium to coarse platy structure parting to moderate medium subangular blocky; firm; few fine roots; hardness of shale increases with depth; very strongly acid.

Solum thickness ranges from 30 to 60 inches. The A horizon ranges from 3 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 7.5YR, value



or 4. Content of coarse fragments in the A horizon is 15 to 30 percent. Reaction is strongly acid unless the surface layer has been limed.

The B21t horizon has hue of 7.5YR or 5YR, value of 5, and chroma of 6 or 8. Texture is silty clay loam, silty clay, or clay. Reaction is strongly acid or very strongly acid. Content of coarse fragments is 5 to 10 percent. The B22t horizon has hue of 5YR, value of 4 or 5, and chroma of 6

Carnasaw series

The Carnasaw series consists of well drained, deep or moderately deep, slowly permeable soils. These soils

B22t—52 to 70 inches; yellowish red (5YR 4/8) sandy loam; common medium prominent brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; very strongly acid; gradual wavy boundary.

B23t—70 to 80 inches; yellowish red (5YR 5/8) sandy loam; many medium prominent brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; very strongly acid.

Solum thickness ranges to more than 80 inches. Reaction is strongly acid or very strongly acid throughout unless the surface layer has been limed.

The A horizon ranges from 40 to 72 inches in thickness. The A1 horizon has hue of 10YR, value of 4, and chroma of 2. The A2 horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4.

The B2t horizon has hue of 5YR, value of 4 or 5, and chroma of 8.

Leadvale series

The Leadvale series consists of deep, moderately well drained soils that formed in loamy sediment washed from uplands of weathered sandstone, siltstone, and shale. Permeability is moderately slow in the upper part of the subsoil and slow in the fragipan. These nearly level and gently sloping soils are on terraces and colluvial foot slopes in the Ouachita Mountains. The native vegetation is mixed hardwoods and pines. Slopes range from 1 to 8 percent.

Leadvale soils are geographically associated with Avilla, Ouachita, and Zafra soils. The nearly level to gently sloping Avilla soils are on terraces. They have a fine-loamy control section and lack a fragipan. Ouachita soils are on flood plains of local drainageways and lack a fragipan. Zafra soils are on the same landscape as Leadvale soils but lack a fragipan.

Typical pedon of Leadvale silt loam in native grass area of Leadvale silt loam, 1 to 3 percent slopes, SE1/4NW1/4SW1/4 sec. 23, T. 1 N., R. 16 W.:

Ap—0 to 5 inches; brown (10YR 4/3) silt loam; weak medium granular structure; friable; many fine roots; strongly acid; clear smooth boundary.

B1—5 to 7 inches; strong brown (7.5YR 5/6) silt loam; weak and moderate medium subangular blocky structure; friable; common fine roots; common fine and medium pores; strongly acid; clear smooth boundary.

B21t—7 to 16 inches; strong brown (7.5YR 5/6) silt loam; moderate medium subangular blocky structure; friable; patchy clay films on faces of peds; common fine roots; common fine pores; very strongly acid; clear smooth boundary.

B22t—16 to 27 inches; strong brown (7.5YR 5/8) silt loam; moderate medium subangular blocky structure; friable; patchy clay films on faces of peds; common fine roots; common fine pores; very strongly acid; clear wavy boundary.

Bx1—27 to 33 inches; yellowish brown (10YR 5/6) silt loam; common medium distinct pale brown (10YR 6/3) and common fine distinct gray mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm and brittle; discontinuous clay films on faces of peds; common fine pores; very strongly acid; gradual wavy boundary.

Bx2—33 to 49 inches; yellowish brown (10YR 5/6) silt loam; common fine distinct light brownish gray and common medium distinct brown (10YR 5/3) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm and brittle;

Solum thickness ranges from 48 to more than 72 inches. Reaction is strongly acid to very strongly acid throughout the profile.

The A horizon ranges from 5 to 10 inches in thickness. The Ap horizon has hue of 10YR, value of 4, and chroma of 2 or 3. The A1 horizon, where present, has hue of 10YR, value of 3, and chroma of 1 or 2. The A2 horizon, where present, has hue of 10YR, value of 5 or 6, and chroma of 3 or value of 6 and chroma of 4.

The B1 horizon has hue of 7.5YR, value of 5, and chroma of 6 or hue of 10YR, value of 6, and chroma of 6 or 8. The B2t horizon has hue of 10YR, value of 5 or 6, and chroma of 6 or 8 or hue of 7.5YR, value of 5, and chroma of 6 or 8. Texture of the B2t and the Bx horizons is silt loam or silty clay loam. The Bx horizon has hue of 10YR, value of 5, and chroma of 6 or 8 and has mottles in shades of brown, yellow, and gray.

Linker series

The Linker series consists of moderately deep, well drained, moderately permeable soils that formed on mountaintops in loamy material weathered from sandstone. The native vegetation is mixed pines and hardwoods. Slopes range from 3 to 8 percent.

Linker soils are geographically associated with Allen soils. The steep Allen soils are on mountainsides. They are deeper to bedrock than Linker soils.

Typical pedon of Linker fine sandy loam in moist wooded area of Linker fine sandy loam, 3 to 8 percent slopes, NE1/4SW1/4NE1/4 sec. 19, T. 1 S., R. 13 W.:

Ap—0 to 5 inches; brown (10YR 4/3) fine sandy loam; moderate fine granular structure; very friable; many fine and medium roots; common fine pores; 5 percent gravel; medium acid; abrupt smooth boundary.

B21t—5 to 9 inches; yellowish red (5YR 5/6) sandy clay loam; moderate medium subangular blocky structure; friable; few thin patchy clay films on some faces of peds; common fine and medium roots; common fine pores; strongly acid; clear wavy boundary.

B22t—9 to 24 inches; red (2.5YR 4/8) clay loam; moderate medium subangular blocky structure; friable; few thin patchy clay films on some faces of peds, in root channels, and around pebbles; few fine pores; extremely acid; clear wavy boundary.

B23t—24 to 30 inches; red (2.5YR 5/8) clay loam; moderate medium subangular blocky structure; friable; few thin patchy clay films on faces of peds; sand grains coated and bridged with clay; very strongly acid; clear wavy boundary.

B24t—30 to 33 inches; red (2.5YR 5/8) sandy clay loam; few red and yellow relic fragments of sandstone; moderate medium subangular blocky structure; friable; patchy clay films on faces of peds; few fine roots; common fine pores; 5 percent gravel; extremely acid.

R—33 to 35 inches; red and brown hard sandstone bedrock.

Solum thickness ranges from 20 to 40 inches. Reaction is strongly acid to extremely acid unless the surface layer has been limed.

The A horizon is dominantly about 5 inches thick, but in places it is less than 4 inches thick. It has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. Content of coarse fragments ranges from 5 to 15 percent.

The B1 horizon, where present, has hue of 7.5YR or 5YR, value of 5, and chroma of 6. Texture is fine sandy loam or loam. The B2t horizon has hue of 5YR or 2.5YR, value of 5, and chroma of 6 or 8. Texture is sandy clay loam or clay loam. The B3 horizon, where present, has hue of 5YR or 2.5YR, value of 5, and chroma of 6 or 8. Texture is sandy clay loam or clay loam. Content of coarse fragments in the B horizon ranges from 0 to 15 percent.

Messer Variant

loamy material. These soils are the mound areas of a mound-intermound complex. The native vegetation is mixed pines and hardwoods. Slopes are 1 to 3 percent.

Messer Variant soils are geographically associated with Caddo Variant soils. Caddo Variant soils are in level intermound areas. They are poorly drained.

Typical pedon of Messer Variant in moist wooded area of Caddo Variant-Messer Variant complex, SE1/4NE1/4SW1/4 sec. 1, T. 1 S., R. 15 W.:

- A1—0 to 2 inches; brown (10YR 4/3) silt loam; moderate medium granular structure; friable; many fine roots; common fine pores; strongly acid; abrupt smooth boundary.
- B1—2 to 11 inches; yellowish brown (10YR 5/6) silt loam; weak fine and medium subangular blocky structure; friable; many fine roots; common fine pores; very strongly acid; clear smooth boundary.
- B21t—11 to 23 inches; yellowish brown (10YR 5/8) silt loam; moderate medium subangular blocky structure; friable; patchy clay films on faces of peds; common pale brown (10YR 6/3) silt coatings on faces of peds; few fine roots; few fine pores; very strongly acid; clear smooth boundary.
- B22t—23 to 35 inches; mottled yellowish brown (10YR 5/6), light reddish brown (2.5YR 6/4), and strong brown (7.5YR 5/8) silt loam; moderate medium subangular blocky structure; friable; 10 percent gravel; few fine roots; few fine pores; patchy clay films on faces of peds; very strongly acid; clear wavy boundary.
- B23t—35 to 42 inches; mottled light brownish gray (10YR 6/2), strong brown (7.5YR 5/8), and yellowish red (5YR 5/8) silt loam; moderate medium subangular blocky structure; friable; patchy clay films on faces of peds; few fine roots; 10 percent gravel; medium acid; clear smooth boundary.
- B3—42 to 72 inches; mottled yellowish brown (10YR 5/6) and strong brown (7.5YR 5/8) very gravelly loam; weak medium and coarse subangular blocky structure; friable; 40 percent gravel; medium acid.

Solum thickness ranges from 60 to 75 inches. Reaction is medium acid to very strongly acid throughout unless the surface layer has been limed.

The A horizon is dominantly about 2 inches thick. It has hue of 10YR, value of 4, and chroma of 2 or 3 or value of 5 and chroma of 2, 3, or 4.

The B1 horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. The B21t horizon has hue of 10YR, value of 5, and chroma of 8. It has pale brown silt coatings. The B22t horizon has hue of 10YR, value of 5 or 6, and chroma of 4 or 6 or is mottled in shades of brown. Texture is silt loam or clay loam. The B23t horizon is mottled gray, brown, and red. Texture is silt loam or clay loam. The B3 horizon is mottled in shades of brown. Texture is very gravelly loam or very gravelly clay loam.

The Messer Variant lacks tongues of A2 material and has more clay in the argillic horizon than is typical for the Messer series. These soils are similar to the Messer series in use, management, and behavior characteristics.

Ouachita series

The Ouachita series consists of deep, well drained, moderately slowly permeable soils on flood plains of local drainageways. These soils formed in alluvium washed from uplands of weathered sandstone and shale. The native vegetation is mixed hardwoods and pine. Slopes are 0 to 2 percent.

Ouachita soils are geographically associated with Amy and Leadvale soils. Amy soils are in depressions. They are poorly drained. Leadvale soils are on terraces. They have a fragipan.

Typical pedon of Ouachita silt loam in moist pasture of Ouachita silt loam, frequently flooded, NE1/4NW1/4NE1/4 sec. 19, T. 1 S., R. 16 W.:

- Ap—0 to 11 inches; brown (10YR 4/3) silt loam; weak medium and coarse granular structure; friable; many fine roots; strongly acid; abrupt smooth boundary.
- B21—11 to 20 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable; few fine roots; few fine pores; strongly acid; clear smooth boundary.
- B22—20 to 26 inches; yellowish brown (10YR 5/6) silt loam; moderate medium and coarse subangular blocky structure; friable; few fine roots; common fine pores; very strongly acid; clear wavy boundary.
- B23—26 to 47 inches; dark yellowish brown (10YR 4/4) silt loam; moderate medium subangular blocky structure; friable; common fine pores; streaks of light yellowish brown (10YR 6/4) silt loam material; very strongly acid; clear smooth boundary.
- B24—47 to 60 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; friable; few fine pores; very strongly acid; clear smooth boundary.
- B3—60 to 72 inches; dark yellowish brown (10YR 4/4) silt loam; common fine distinct pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable; common fine pores; very strongly acid.

Solum thickness ranges from 40 to 80 inches. Reaction is strongly acid or very strongly acid throughout unless the soil has been limed.

The A horizon is dominantly about 11 inches thick, but it ranges from 7 to 18 inches in thickness. It has hue of 10YR, value of 4 or 5, and chroma of 3.

The B2 horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4 or value of 5 and chroma of 6. The B3 horizon, where present, is mottled in shades of gray and brown.

Pirum series

The Pirum series consists of moderately deep, well drained, moderately permeable soils that formed in loamy colluvial material over bedrock that is tilted and fractured shale, sandstone, or quartzite. These soils are in colluvial positions in the Ouachita Mountains. The native vegetation is mixed hardwoods and pines. Slopes range from 1 to 30 percent.

Pirum soils are geographically associated with Carnasaw and Townley soils. Carnasaw and Townley soils are in the Ouachita Mountains on the tops and sides of hills, mountains, and benches and on low ridges in valleys. These soils are more clayey than Pirum soils.

Typical pedon of Pirum loam in moist wooded area of Carnasaw-Townley-Pirum association, steep, NE1/4NW1/4NW1/4 sec. 9, T. 2 N., R. 17 W.:

- A1—0 to 2 inches; brown (10YR 5/3) loam; weak fine granular structure; friable; 5 percent gravel; many fine roots; strongly acid; clear smooth boundary.
- A2—2 to 10 inches; light yellowish brown (10YR 6/4) loam; weak fine and medium granular structure; friable; 5 percent gravel; many fine roots; few medium and common fine pores; strongly acid; clear smooth boundary.
- B21t—10 to 17 inches; yellowish brown (10YR 5/6) loam; moderate medium subangular blocky structure; friable; patchy clay films on faces of peds and in voids; few fine roots; common fine pores; 10 to 15 percent fragments of shale and sandstone 1/4 inch to 3 inches in diameter; very strongly acid; clear wavy boundary.
- B22t—17 to 34 inches; strong brown (7.5YR 5/6) loam; moderate medium subangular blocky structure; friable; patchy clay films on faces of peds and in voids; few fine roots; common fine pores; 10 to 15 percent fragments of shale and sandstone 1/4 inch to 3 inches in diameter; very strongly acid; abrupt irregular boundary.
- R—34 to 36 inches; hard, tilted and fractured, gray and brown shale bedrock.

Solum thickness ranges from 22 to 50 inches. Reaction is strongly acid or very strongly acid unless the surface layer has been limed.

has hue of 10YR, value of 4, and chroma of 2 or 3 or value of 5 and chroma of 3. The A2 horizon has hue of 10YR, value of 5 or 6, and chroma of 4.

The B2t horizon has hue of 10YR, value of 5 or 6, and chroma of 6 or 8 or hue of 7.5YR, value of 5, and chroma of 6 or 8. Texture is loam or clay loam.

Saffell series

The Saffell series consists of deep, well drained, moderately permeable soils that formed in gravelly and loamy sediments. These gently sloping soils are on uplands of the Coastal Plain. The native vegetation is mixed hardwoods and pines. Slopes range from 3 to 8 percent.

Saffell soils are geographically associated with Darco and Smithdale soils. The moderately steep to steep Darco soils are on uplands. They have a loamy control section. The gently sloping to moderately sloping Smithdale soils also are on uplands. They have a fine-loamy control section.

Typical pedon of Saffell gravelly fine sandy loam in a pasture of Saffell gravelly fine sandy loam, 3 to 8 percent slopes, SW1/4NE1/4SE1/4 sec. 21, T. 2 S., R. 13 W.:

Ap—0 to 4 inches; brown (10YR 4/3) gravelly fine sandy loam; weak fine granular structure; friable; 25 percent gravel; many fine roots; strongly acid; clear smooth boundary.

B1—4 to 9 inches; reddish brown (5YR 4/4) gravelly fine sandy loam; moderate medium subangular blocky structure; friable; thin patchy clay films on some peds; sand grains coated and bridged with clay; common fine roots; few fine pores; 25 percent gravel; very strongly acid; clear smooth boundary.

B21t—9 to 20 inches; yellowish red (5YR 4/8) very gravelly sandy clay

The Savannah series consists of deep, moderately well drained soils that formed in thick beds of loamy sediment. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. These nearly level and gently sloping soils are on uplands and stream terraces of the Coastal Plain. The native vegetation is mixed hardwoods and pines. Slopes range from 1 to 8 percent.

Savannah soils are geographically associated with Amy, Angie, Smithdale, Tiak, Udorthents, and Wrightsville soils. The level Amy soils are on broad upland flats and on flood plains. They are fine-silty and do not have a fragipan. The gently sloping Angie soils are on uplands. They are clayey and do not have a fragipan. The gently sloping and moderately sloping Smithdale soils also are on uplands. They are well drained and lack a fragipan. The gently sloping Tiak soils are on uplands. They are clayey. The somewhat excessively drained Udorthents are nearly level to very steep. They are in areas of mine spoils. The level to depressional Wrightsville soils are on old stream terraces. They are poorly drained and lack a fragipan.

Typical pedon of Savannah fine sandy loam, in wooded area of Savannah fine sandy loam, 3 to 8 percent slopes, SW1/4NE1/4NE1/4 sec. 19, T. 2 S., R. 12 W.:

Ap—0 to 8 inches; brown (10YR 5/3) fine sandy loam; weak fine and medium granular structure; very friable; many fine roots; strongly acid; clear smooth boundary.

A2—8 to 14 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine and medium granular and weak subangular blocky structure; friable; few fine roots; strongly acid; clear smooth boundary.

B1—14 to 19 inches; yellowish brown (10YR 5/6) loam; weak medium subangular blocky structure; friable; common fine pores; strongly acid; clear smooth boundary.

B2t—19 to 32 inches; yellowish brown (10YR 5/6) loam; moderate medium subangular blocky structure; friable; thin patchy clay films on

The Bt horizon has hue of 7.5YR, value of 5, and chroma of 6 or 8 or hue of 10YR, value of 5, and chroma of 4, 6, or 8. The Bx horizon is mottled yellow, brown, and gray or is yellowish brown mottled with gray.

Sherwood series

The Sherwood series consists of moderately deep to deep, well drained, moderately permeable soils that formed in loamy residuum weathered from nepheline-syenite. These gently sloping to moderately sloping soils are on uplands. The native vegetation is mixed hardwoods and pines. Slopes range from 3 to 12 percent.

Sherwood soils are geographically associated with Udorthents. The Udorthents are excessively drained soils that have been altered by mining operations, and the soil material is quite variable.

Typical pedon of Sherwood loam in wooded area of Sherwood-Rock outcrop complex, 3 to 12 percent slopes, NW1/4SE1/4SW1/4 sec. 23, T. 2 S., R. 14 W.:

Udorthents. The steep Allen soils are on mountainsides. They have more clay in the lower part of the B horizon than Smithdale soils. Amy soils are on broad upland flats. They are poorly drained. The nearly level and gently sloping Savannah soils are on uplands. They are moderately well drained and have a fragipan. The gently sloping Saf-fell soils are on uplands and are gravelly throughout. The gently sloping Tiak soils also are on uplands. They have a clayey control section. The steep Darco soils are on uplands. They have a thicker A. horizon than Smithdale soils. The nearly level to very steep Udorthents are somewhat excessively drained. They are in areas of mine spoils.

Typical pedon of Smithdale loamy sand in moist orchard area of Smithdale-Urban land complex, 3 to 8 percent slopes, NW1/4NE1/4NE1/4 sec. 7, T. 2 S., R. 12 W.:

Ap—0 to 6 inches: yellowish brown (10YR 5/4) loamy sand; weak medi-



The B1 horizon has hue of 7.5YR, value of 5, and chroma of 6 or 8. The Bt horizon has hue of 5YR, value of 4 or 5, and chroma of 6 or 8 or hue of 2.5YR, value of 4, and chroma of 8. Texture is fine sandy loam or sandy clay loam.

Tiak series

The Tiak series consists of moderately well drained, deep, slowly permeable soils that formed in loamy and clayey sediments. These gently sloping to moderately sloping soils are on uplands of the Coastal Plain. The native vegetation is mixed hardwoods and pines. Slopes range from 3 to 12 percent.

Tiak soils are geographically associated with Savannah and Smithdale soils. The nearly level and gently sloping Savannah soils are on uplands, are not clayey, and have a fragipan. The gently sloping, and moderately sloping Smithdale soils are on uplands. They are well drained and are not clayey.

Typical pedon of Tiak silt loam in a moist wooded area of Tiak silt loam, 3 to 8 percent slopes, SW1/4SW1/4NE1/4 sec. 33, T. 2 S., R. 12 W.:

Ap—0 to 7 inches; brown (10YR 5/3) silt loam; weak fine granular structure; very friable; many fine and medium roots; about 5 percent sandstone gravel as much as 2 inches in diameter; very strongly acid; clear smooth boundary.

A2—7 to 12 inches; light yellowish brown (10YR 6/4) loam; weak fine granular structure; very friable; common fine and medium roots; many fine pores; 5 percent sandstone gravel 1/4 inch to 3 inches in diameter; very strongly acid; clear smooth boundary.

B21t—12 to 22 inches; red (2.5YR 4/8) clay; weak medium subangular blocky structure; firm; few fine and medium roots; few medium pores; clay films on faces of peds; very strongly acid; clear smooth boundary.

B22t—22 to 32 inches; red (2.5YR 4/8) clay; many medium prominent gray (10YR 6/1) mottles; moderate medium subangular blocky structure; firm; few medium roots; many fine pores; clay films on most faces of peds; very strongly acid; clear wavy boundary.

B23t—32 to 53 inches; mottled red (2.5YR 4/8) and gray (10YR 6/1) clay; moderate medium and fine subangular blocky structure; firm; few medium roots; few fine pores; clay films on some faces of peds; very strongly acid; clear smooth boundary.

B24t—53 to 64 inches; light gray (10YR 7/1) clay; common medium prominent red (2.5YR 4/8) mottles; moderate medium and fine subangular blocky structure; firm; common fine pores; thick clay films on vertical and horizontal faces of peds; very strongly acid; clear smooth boundary.

B3—64 to 72 inches; mottled gray (10YR 6/1), red (2.5YR 4/8), and yellowish red (5YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; few fine roots; many fine pores; clay films on some faces of peds; sand grains coated and bridged with clay in the red parts; very strongly acid.

Solum thickness is more than 60 inches. Reaction is very strongly acid unless the surface layer has been limed.

The A horizon ranges from 5 to 12 inches in thickness. It has hue of 10YR, value of 3 or 4, and chroma of 2 or 3 or value of 5 or 6 and chroma of 3 or 4.

The B21t horizon has hue of 5YR, value of 5, and chroma of 8 or hue of 2.5YR, value of 4, and chroma of 8. In places the B21t horizon is mottled yellowish brown or light brownish gray. The B22t horizon has hue of 2.5YR, value of 4, and chroma of 8 and has gray mottles, or it is mottled in shades of red, brown, and gray. The B23t and B24t horizons are mottled in shades of red, brown, yellow, and gray. The B3 horizon is mottled gray and red sandy clay loam or fine sandy loam.

Townley series

The Townley series consists of moderately deep, well drained, slowly permeable soils that formed in a thin layer of loamy material and the underlying material weathered from shale. This is underlain by tilted and fractured shale, sandstone, or quartzite. These soils are in the Ouachita Mountains on nearly level tops and steep sides of hills, mountains, and benches and on low ridges in valleys. The native vegetation is mixed hardwoods and pines. Slopes range from 1 to 40 percent.

Townley soils are geographically associated with Carnasaw and Pirum soils. Carnasaw soils are on the same landscape as Townley soils but are deeper to bedrock. Pirum soils are in colluvial positions in the Ouachita Mountains. They are not so clayey as Townley soils.

Typical pedon of Townley silt loam in moist wooded area of Carnasaw-Townley-Pirum association, steep, NE1/4NW1/4NE1/4 sec. 17, T. 2 N., R. 17 W.:

A1—0 to 6 inches; brown (10YR 4/3) silt loam; weak medium granular structure; friable; common fine roots; 10 percent shale and sandstone fragments 1/4 inch to 3 inches in diameter; strongly acid; abrupt smooth boundary.

B21t—6 to 10 inches; yellowish red (5YR 5/8) silty clay loam; weak fine subangular blocky structure; friable; 10 percent shale and sandstone fragments 1/4 inch to 3 inches in diameter; continuous clay films on ped faces; few fine roots; many fine pores; very strongly acid; clear smooth boundary.

B22t—10 to 17 inches; red (2.5YR 4/8) silty clay; moderate fine and medium subangular blocky structure; friable; continuous clay films on faces of peds; 10 percent shale and sandstone fragments 1/4 inch to 3 inches in diameter; common fine and medium roots; many fine pores; extremely acid; clear smooth boundary.

B23t—17 to 23 inches; yellowish red (5YR 4/8) silty clay; moderate medium subangular blocky structure; friable; thin nearly continuous clay films on faces of most peds; 10 percent shale and sandstone fragments 1/4 inch to 3 inches in diameter; common fine and medium roots; many fine pores; brown (7.5YR 5/4) silty clay material around shale fragments; very strongly acid; clear wavy boundary.

Cr—23 to 25 inches; gray (10YR 5/1) tilted and fractured shale with a hardness less than 3 on Mohs' scale; rippable by hand; roots have horizontal spacing of more than 4 inches; very strongly acid.

Solum thickness ranges from 18 to 30 inches. Reaction is strongly acid to extremely acid unless the surface layer has been limed.

The A horizon ranges from 4 to 9 inches in thickness. The A1 horizon has hue of 10YR, value of 3, and chroma of 2; value of 4 and chroma of 2 or 3; or value of 5 and chroma of 3.

The B1 horizon, where present, has hue of 7.5YR, value of 5, and chroma of 6 or 8. The B2t horizon has hue of 7.5YR, value of 5, and chroma of 6 or 8; hue of 5YR, value of 4 or 5, and chroma of 6 or 8; or hue of 2.5YR, value of 4 or 5, and chroma of 8. Texture is silty clay loam or silty clay.

The Cr horizon is tilted and fractured weathered shale.

Udorthents

Udorthents consist of excessively drained, moderately rapidly permeable, nearly level to very steep soils on uplands of the Coastal Plain. The soils have been altered or obscured by bauxite mining operations, and the soil material, therefore, is quite variable. These soils are extremely acid to moderately alkaline in the surface layer. Texture ranges from very fine sandy loam to gravelly

fine sandy loam. The C horizon is extremely acid or very strongly acid. Texture ranges from gravelly loamy sand to very gravelly silty clay loam.

Udorthents are geographically associated with Smithdale, Savannah, and Sherwood soils. The gently sloping and moderately sloping Smithdale soils are on uplands of the Coastal Plain. They are well drained, moderately permeable soils that formed in thick beds of loamy sediment. The nearly level and gently sloping Savannah soils also are on uplands of the Coastal Plain. They are moderately well drained, moderately permeable soils that have a fragipan. The gently sloping to moderately sloping Sherwood soils are on uplands. They formed in loamy residuum weathered from nepheline-syenite.

Wrightsville series

The Wrightsville series consists of deep, poorly drained, very slowly permeable soils that formed in loamy and clayey sediments. These level to depressional soils are on old stream terraces on the Coastal Plain. They are saturated with water late in winter and early in spring. The native vegetation is mixed pines and hardwoods. Slopes are dominantly less than 1 percent.

Wrightsville soils are geographically associated with Amy, Angie, and Savannah soils. Amy soils are on broad upland flats and on flood plains. They are not so clayey in the B horizon as the Wrightsville soils. The gently sloping Angie soils are on uplands of the Coastal Plain. They are moderately well drained. The nearly level and gently sloping Savannah soils also are on uplands of the Coastal

or 5, and chroma of 2. The A2 horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2 or value of 5 and chroma of 1. Some A2 horizons have mottles of brownish yellow or yellowish brown.

The B2tg horizon has hue of 10YR, value of 5 or 6, and chroma of 1. Texture is silty clay loam or silty clay with tongues of silt loam material into or through the horizon. Mottles, where present, are in shades of brown.

The C horizon is mottled in shades of brown and yellow.

Zafra series

The Zafra series consists of moderately deep to deep, well drained, moderately permeable soils that formed on stream terraces in alluvium washed from uplands of the Ouachita Mountains. The native vegetation is mixed pines and hardwoods. Slopes range from 3 to 8 percent.

Zafra soils are geographically associated with Carnasaw and Leadvale soils. The gently sloping to steep Carnasaw soils are on uplands. They are clayey. The nearly level to gently sloping Leadvale soils are on terraces. They are moderately well drained and have a fragipan.

Typical pedon of Zafra loam, in moist grassed area of Zafra-Leadvale complex, 3 to 8 percent slopes, SW1/4SW1/4NW1/4 sec. 15, T. 1 N., R. 18 W.:

Ap—0 to 8 inches; dark brown (10YR 4/3) loam; moderate medium granular structure; friable; many fine roots; 10 percent sandstone and quartzite gravel; medium acid; abrupt irregular boundary.

B21t—8 to 16 inches; yellowish red (5YR 4/6) gravelly clay loam; moderate medium subangular blocky structure; friable; 30 percent gravel; few fine roots; few fine pores; continuous clay films on many faces of peds; medium acid; clear wavy boundary.

B22t—16 to 29 inches; yellowish red (5YR 4/8) very gravelly clay loam; moderate fine and medium subangular blocky structure; friable; few fine roots; many fine pores; 60 percent gravel; patchy clay films on most faces of peds; strongly acid; gradual wavy boundary.

soil properties that can be observed in the field or those that can be inferred either from other properties that are observable in the field or from the combined data of soil science and other disciplines. The properties selected for the higher categories are the result of soil genesis or of factors that affect soil genesis. In table 21, the soils of the survey area are classified according to the system. Categories of the system are discussed in the following paragraphs.

ORDER. Ten soil orders are recognized as classes in the system. The properties used to differentiate among orders are those that reflect the kind and degree of dominant soil-forming processes that have taken place. Each order is identified by a word ending in *sol*. An example is Ultisol.

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

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of expression of pedogenic horizons; soil moisture and temperature regimes; and base status. Each

stratum, are similar in differentiating characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistency, and mineral and chemical composition.

Formation of the soils

The following pages describe the factors of soil formation, relate them to soils in the survey area, and explain the processes of soil formation.

Factors of soil formation

Soil forms through weathering and other processes that act upon the regolith. The characteristics of the soil at any given point depend upon climate, living organisms, parent material, relief, and time. Each factor acts on the soil and modifies the effects of the other four. If climate, living organisms, or any other one of the five factors significantly differs, a different soil can form.

Climate and living organisms are the active forces in soil formation. Relief modifies the effects of climate and living organisms, mainly through its influence on temperature and runoff. Because climate, vegetation, parent material, and relief interact over a period of time, time is the fifth factor of soil formation. Thus the effect of time

On the Coastal Plain, the native vegetation was mixed stands of shortleaf and loblolly pine, oak, and hickory. Some of the greatest differences in the soils of Saline County are caused by differences in relief through its ef-

soils formed in these areas. They differ chiefly in parent material and relief. Ouachita soils and some Amy soils formed along drainageways where the native vegetation was mainly mixed hardwoods.

In the Ouachita Mountains in the northern and western parts of the county, the native vegetation was upland oaks, hickory, and shortleaf pine. Carnasaw and Townley soils formed in material that remained in place. Leadvale and Avilla soils formed on stream terraces in this area.

With the development of agriculture in the county, man is influencing the formation of the soils. Man is changing

through the soil. The relief ranges from nearly vertical bluffs to broad flats.

The Ouachita Mountains are in the western and northern parts of the county. The slope is mainly 1 to 12 percent but ranges from 1 to 60 percent.

The Coastal Plain in the eastern and southern parts of the county is level to rolling. The slope is mainly 3 to 8 percent but ranges from 0 to 12 percent.

Time

The length of time required for soil formation depends

some young soils where the C horizon underlies the A horizon, it has been slightly modified by living organisms. (5) United States Department of Agriculture. 1967. Soil survey laboratory methods and procedures for collecting soil samples. Soil

- pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.
- Channery soil.** A soil, that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a fragment.
- Clay.** As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.
- Clay film.** A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coat, 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.** Mineral or rock particles up to 3 inches (2 millimeters to 7.5 centimeters) in diameter.
- Coarse textured (light textured) soil.** Sand or loamy sand.
- Cobblestone (or cobble).** A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.
- Colluvium.** Soil material, rock fragments, or both, moved by creep, slide, or local wash and deposited at the bases of steep slopes.
- Complex slope.** Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures is difficult.
- Complex, soil.** A mapping unit of two or more kinds of soil occurring in such an intricate pattern that they cannot be shown separately on a soil map at the selected scale of mapping and publication.
- Compressible.** 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 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 for 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, as for example in "hillpeats" and "climatic moors."
- Drainage, surface.** Runoff, or surface flow of water, from an area.
- Eluviation.** The movement of material in true solution or colloidal

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 (heavy textured) soil. Sandy clay, silty clay, and clay.

Flooding. The temporary covering of soil with water from overflowing streams, runoff from adjacent slopes, and tides. Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or a combination of these; (2) by prismatic or blocky structure; (3) by redder or browner colors than those in the A horizon; or (4) by a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil lacks 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

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 single 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.

Nutrient, plant. Any element taken in by a plant, essential to its growth, and used by it in the production of food and tissue. Plant nutrients are nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, zinc, and perhaps other elements obtained from the soil; and carbon, hydrogen, and oxygen obtained largely from the air and water.

Pan. A compact, dense layer in a soil. A pan impedes the movement of water and the growth of roots. The word "pan" is commonly combined with other words that more explicitly indicate the nature of the layer—for example, *hardpan, subsoil, claypan, claypan, and*

Reaction, soil. The degree 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—

	<i>pH</i>
Extremely acid	Below 4.5
Very strongly acid.....	4.5 to 5.0
Strongly acid.....	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral.....	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock. Soil scientists regard as soil only the part of the regolith that is modified by organisms and other soil-building forces. Most engineers describe the whole regolith, even to a great depth, as "soil."

Relief. The elevations or inequalities of a land surface, considered collectively.



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.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slow intake. The slow movement of water into the soil.

Slow refill. The slow filling of ponds, resulting from restricted permeability in the soil.

Soil. A natural, three-dimensional body at the earth's surface that 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: *very coarse sand* (2.0 millimeters to 1.0 millimeter); *coarse sand* (1.0 to 0.5 millimeter); *medium sand* (0.5 to 0.25 millimeter); *fine sand* (0.25 to 0.10 millimeter); *very fine sand* (0.10 to 0.05 millimeter); *silt* (0.005 to 0.002 millimeter); and *clay* (less than 0.002 millimeter).

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in mature 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 other plant and animal life characteristics of the soil 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.

Stratified. Arranged in strata, or layers. The term refers to geologic material. Layers in soils that result from the processes of soil formation are called horizons; those inherited from the parent material are called strata.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates that are separated from adjoining aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. 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 soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use or management.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea. A stream terrace is frequently called a second bottom, in contrast with a flood plain, and is seldom subject to overflow. A marine terrace, generally wide, was deposited by 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*, *silt loam*, *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."

Tilth, soil. The condition of the soil, especially the soil structure, as related to the growth of plants. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil (engineering). Presumably a fertile soil or soil material, or one that responds to fertilization, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Unstable fill. Risk of caving or sloughing in banks of fill material.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but the limited geographic soil area does not justify creation of a new series.

Variation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Water table. The upper limit of the soil or underlying rock material that is wholly saturated with water.

Water table, apparent. A thick zone of free water in the soil. An apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Water table, artesian. A water table under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole.

Water table, perched. A water table standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

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 a soil or soil material consisting of particles well distributed over a wide range in size or diameter. Such a soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Illustrations



Figure 1.—Bermudagrass pasture on Caddo Variant-Messer Variant complex. The Caddo Variant is in the swales. The Messer Variant is on the mounds.



Figure 2.—A good stand of young loblolly pine on Carnasaw-Townley association, undulating.



Figure 3.—Such tilted bedrock underlies soils in the Carnasaw-Townley association, steep.



Figure 4.—Hay harvested on Leadvale silt loam, 3 to 8 percent slopes.



Figure 5.—Pasture of bermudagrass and legumes on Ouachita silt loam, frequently flooded.

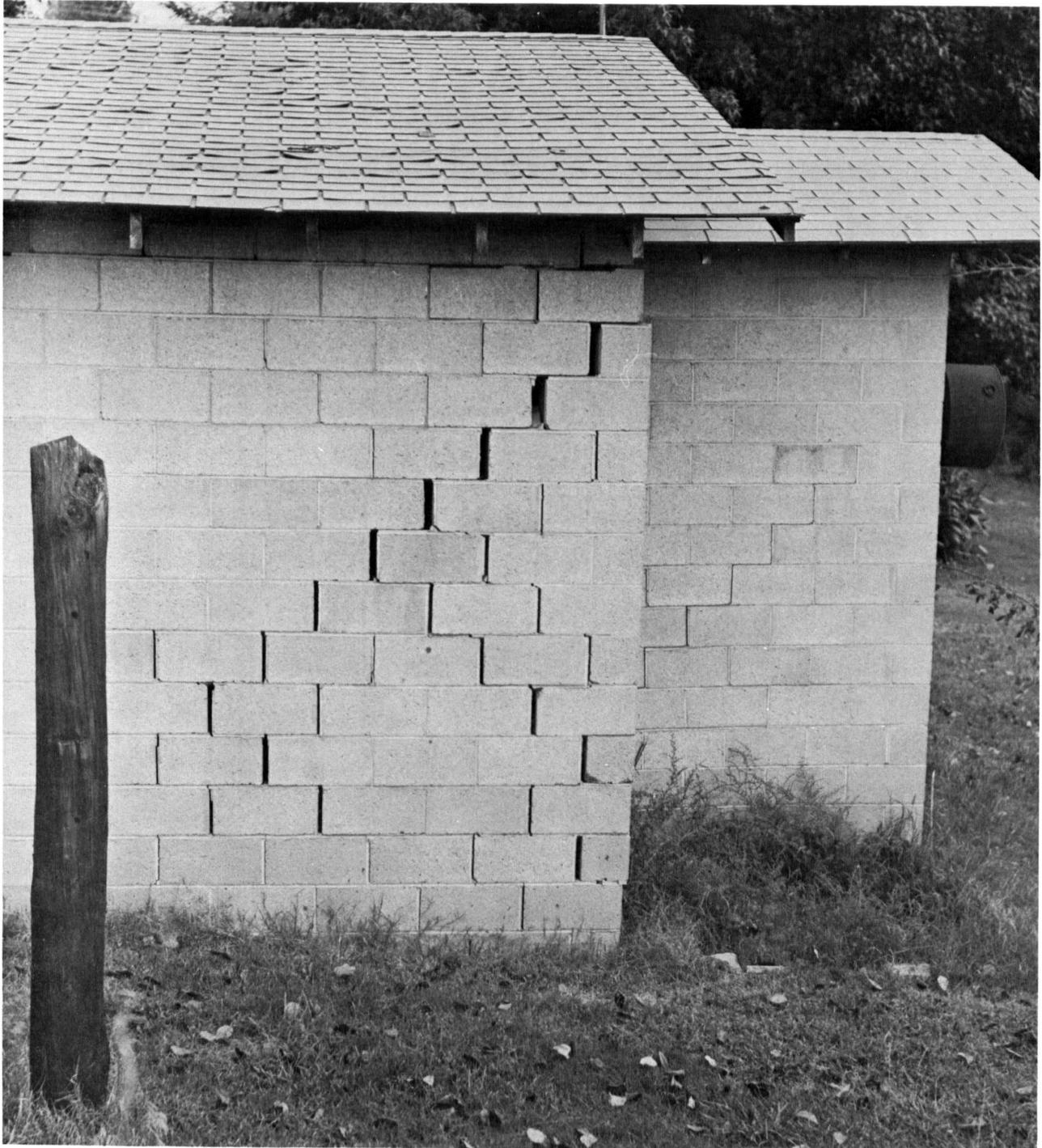


Figure 6.—A good area for wildlife habitat on Sherwood-Rock outcrop complex, 3 to 12 percent slopes.



Figure 7—Cracks in a concrete wall because of the high-shrink swell of Tialk soils in the Tialk Ushes land complex. 9

Tables

SOIL SURVEY

TABLE 1.--ACREAGE OF PRINCIPAL CROPS IN 1964 AND 1969

Crop	1964	1969
Soybeans-----	555	1,106
Hay (except for sorghum hay)-----	8,286	7,142
Pasture and rangeland-----	5,974	6,774

TABLE 2.--NUMBER OF LIVESTOCK AND POULTRY IN 1964 AND 1969

Livestock and Poultry	1964	1969
All cattle and calves-----	13,874	10,833
Milk cows-----	1,434	825
Hogs and pigs-----	743	361
Chickens ¹ -----	46,805	35,414

¹More than 3 months old.

TABLE 3.--TEMPERATURE AND PRECIPITATION DATA

Month	Temperature ¹						Precipitation ¹				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have--		Average number of growing degree days ²	Average	2 years in 10 will have--		Average number of days with 0.10 inch or more	Average snowfall
				Maximum temperature higher than--	Minimum temperature lower than--			Less than--	More than--		
<u>F</u>	<u>F</u>	<u>F</u>	<u>F</u>	<u>F</u>	<u>F</u>	<u>Units</u>	<u>In</u>	<u>In</u>	<u>In</u>	<u>In</u>	
January----	52.2	30.1	41.2	74	7	17	4.18	1.78	6.12	6	2.0
February----	56.4	33.1	44.8	76	11	40	3.76	2.04	5.16	6	1.1
March-----	63.9	39.2	51.6	85	19	175	5.15	2.92	6.97	8	.4
April-----	75.1	49.7	62.4	89	30	376	5.17	2.48	7.36	7	.0
May-----	82.0	57.6	69.8	93	40	614	5.37	2.61	7.62	7	.0
June-----	88.9	65.3	77.1	99	50	813	4.44	1.55	6.76	6	.0
July-----	92.6	68.8	80.7	103	56	952	4.14	2.39	5.56	7	.0
August-----	92.1	67.6	79.9	102	55	927	3.43	1.40	5.10	5	.0
September--	86.2	61.8	74.1	98	44	723	4.41	1.38	6.84	5	.0
October----	76.5	50.7	63.7	91	31	425	3.32	1.06	5.12	4	.0
November---	63.2	39.9	51.6	81	19	126	4.17	2.01	5.92	5	.3
December---	54.1	33.3	43.7	75	10	31	4.29	2.36	5.95	6	.7
Year-----	73.6	49.8	61.7	104	4	5,219	51.83	42.41	60.82	72	4.5

¹Recorded in the period 1951-73 at Alum Fork, Arkansas.

²A 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).

SOIL SURVEY

TABLE 4.--FREEZE DATES IN SPRING AND FALL

Probability	Temperature ¹		
	24 F or lower	28 F or lower	32 F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	March 23	March 31	April 18
2 years in 10 later than--	March 16	March 27	April 13
5 years in 10 later than--	March 2	March 18	April 5
First freezing temperature in fall:			
1 year in 10 earlier than--	November 7	October 31	October 25
2 years in 10 earlier than--	November 15	November 6	October 29
5 years in 10 earlier than--	November 29	November 16	November 6

¹Recorded in the period 1951-73 at Alum Fork, Arkansas.

TABLE 5.--GROWING SEASON LENGTH

Probability	Daily minimum temperature during growing season ¹		
	Higher than 24 F Days	Higher than 28 F Days	Higher than 32 F Days
9 years in 10	242	220	196
8 years in 10	252	228	202
5 years in 10	271	243	214
2 years in 10	290	258	226
1 year in 10	300	266	232

¹Recorded in the period 1951-73 at Alum Fork, Arkansas.

TABLE 6.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
1	Allen loam, 20 to 40 percent slopes-----	2,147	0.5
2	Amy silt loam-----	10,650	2.3
3	Amy silt loam, frequently flooded-----	22,742	4.9
4	Amy soils-----	3,174	0.7
5	Angie fine sandy loam, 3 to 8 percent slopes-----	1,476	0.3
6	Avilla silt loam, 1 to 3 percent slopes-----	3,072	0.7
7	Avilla silt loam, 3 to 8 percent slopes-----	3,960	0.9
8	Caddo Variant-Messer Variant complex-----	7,236	1.6
9	Carnasaw-Townley association, undulating-----	43,430	9.4
10	Carnasaw-Townley association, steep-----	145,688	31.4
11	Carnasaw-Pirum-Townley association, undulating-----	1,840	0.4
12	Carnasaw-Townley-Pirum association, steep-----	64,208	13.9
13	Leadvale silt loam, 1 to 3 percent slopes-----	2,919	0.6
14	Leadvale silt loam, 3 to 8 percent slopes-----	2,065	0.4
15	Linker fine sandy loam, 3 to 8 percent slopes-----	1,452	0.3
16	Ouachita silt loam, frequently flooded-----	20,477	4.4
17	Ouachita-Amy complex, frequently flooded-----	3,363	0.7
18	Saffell gravelly fine sandy loam, 3 to 8 percent slopes-----	6,191	1.3
19	Saffell-Urban land complex, 3 to 8 percent slopes-----	2,297	0.5
20	Savannah fine sandy loam, 1 to 3 percent slopes-----	7,295	1.6
21	Savannah-Urban land complex, 1 to 3 percent slopes-----	1,404	0.3
22	Savannah fine sandy loam, 3 to 8 percent slopes-----	25,060	5.4
23	Savannah-Urban land complex, 3 to 8 percent slopes-----	1,239	0.3
24	Sherwood-Rock outcrop complex, 3 to 12 percent slopes-----	1,646	0.4
25	Smithdale loamy sand, 3 to 8 percent slopes-----	23,661	5.1
26	Smithdale-Urban land complex, 3 to 8 percent slopes-----	3,411	0.7
27	Smithdale loamy sand, 8 to 12 percent slopes-----	3,702	0.8
28	Smithdale and Darco loamy sands, 12 to 30 percent slopes-----	2,140	0.5
29	Tiak silt loam, 3 to 8 percent slopes-----	18,610	4.0
30	Tiak-Urban land complex, 3 to 8 percent slopes-----	1,305	0.3
31	Tiak silt loam, 8 to 12 percent slopes-----	1,387	0.3
32	Udorthents-----	5,815	1.3
33	Wrightsville silt loam-----	3,893	0.8
34	Zafra-Leadvale complex, 3 to 8 percent slopes-----	9,420	2.0
	Water-----	4,793	1.0
	Total-----	463,168	100.0

SOIL SURVEY

TABLE 7.--YIELDS PER ACRE OF CROPS AND PASTURE

[All yields were estimated for a high level of management in 1976. Absence of a yield figure indicates the

Soil name and map symbol	Cotton lint	Soybeans	Wheat	Common bermudagrass	Improved bermudagrass	Bahiagrass
	Lb	Bu	Bu	AUM ¹	AUM ¹	AUM ¹
Allen:						
1-----	---	---	---	---	---	---
Amy:						
2, 24-----	450	25	---	6.0	---	7.5
3-----	---	---	---	6.0	---	7.5
Angie:						
5-----	400	---	---	5.0	---	6.5
Avilla:						
6-----	---	25	35	7.0	8.5	---
7-----	---	20	30	7.0	8.5	---
Caddo Variant:						
28:						
Caddo part-----	---	24	---	5.2	---	6.4
Messer part-----	---	25	---	5.5	---	6.0
Carnasaw:						
29:						
Carnasaw part-----	---	---	---	---	5.5	6.0
Townley part-----	450	---	---	---	---	6.0
210:						
Carnasaw part-----	---	---	---	---	---	---
Townley part-----	---	---	---	---	---	---
211:						
Carnasaw part-----	---	---	---	---	5.5	6.0
Pirum part-----	450	20	---	6.5	7.5	7.0
Townley part-----	450	---	---	---	---	5.0
212:						
Carnasaw part-----	---	---	---	---	---	---
Townley part-----	---	---	---	---	---	---
Pirum part-----	---	---	---	---	---	---
Leadvale:						
13-----	675	32	45	6.0	8.0	7.0
14-----	600	30	40	6.0	8.0	7.0
Linker:						
15-----	500	20	25	5.5	---	---
Ouachita:						
16-----	---	35	---	7.0	9	7.0
217-----	---	---	---	6.6	---	7.3
Saffell:						
18-----	---	---	30	4.0	5.0	5.0

TABLE 7.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Cotton lint	Soybeans	Wheat	Common bermudagrass	Improved bermudagrass	Bahiagrass
	<u>Lb</u>	<u>Bu</u>	<u>Bu</u>	<u>AUM¹</u>	<u>AUM¹</u>	<u>AUM¹</u>
Savannah:						
20-----	625	35	---	---	8.5	9.0
221-----	---	---	---	---	---	---
22-----	525	30	---	---	8.0	9.0
223-----	---	---	---	---	---	---
Sherwood:						
224-----	---	---	---	---	---	---
Smithdale:						
25-----	600	30	---	5.5	9.0	---
226-----	---	---	---	---	---	---
27-----	400	25	---	5.0	9.0	---
228:						
Smithdale part-----	---	---	---	---	7.0	6.0
Darco part-----	---	---	---	---	5.0	5.0
Tiak:						
29-----	400	---	---	---	5.0	---
230-----	---	---	---	---	---	---
31-----	300	---	---	---	4.5	---
Udorthents:						
32-----	---	---	---	---	---	---
Wrightsville:						
33-----	450	25	25	7.0	---	7.5
Zafra:						
234:						
Zafra part-----	---	---	---	---	5.0	---
Leadvale part-----	600	30	40	6.0	8.0	7.0

¹Animal-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 a period of 30 days.

²This map unit is made up of two or more dominant kinds of soil. See map unit description for the composition and behavior of the whole map unit.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed in this table. Absence of an entry in a column means the information was not available]

Soil name and map symbol	Wood-land suitability group	Management concerns			Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Important trees	Site index	
Allen: 1-----	3r8	Moderate	Moderate	Slight	Shortleaf pine----- Southern red oak----	60 71	Loblolly pine, black walnut, shortleaf pine.
Amy: 2, 14-----	2w9	Slight	Severe	Severe	Loblolly pine----- Shortleaf pine----- Sweetgum-----	90 80 90	Loblolly pine, sweetgum.
3-----	2w9	Slight	Severe	Severe	Loblolly pine----- Sweetgum----- Water oak-----	90 90 90	Loblolly pine, sweetgum, eastern cottonwood, green ash, American sycamore, Nuttall oak.
Angie: 5-----	2w8	Slight	Moderate	Slight	Loblolly pine----- Shortleaf pine----- Sweetgum-----	86 79 90	Loblolly pine, sweetgum.
Avilla: 6, 7-----	3o7	Slight	Slight	Slight	Shortleaf pine----- Southern red oak----- Loblolly pine----- Cherrybark oak----- Sweetgum----- Black walnut-----	65 65 70 -- 70 --	Loblolly pine, shortleaf pine, black walnut, cherrybark oak.
Caddo Variant: 18: Caddo part-----	2w9	Slight	Severe	Moderate	Loblolly pine----- Sweetgum----- Water oak----- Shortleaf pine-----	86 94 88 75	Loblolly pine.
Messer part-----	2w8	Slight	Moderate	Slight	Loblolly pine----- Sweetgum-----	90 90	Loblolly pine.
Carnasaw: 19: Carnasaw part---	3o1	Slight	Slight	Slight	Shortleaf pine----- Loblolly pine-----	70 80	Loblolly pine, shortleaf pine.
Townley part---	4o1	Slight	Slight	Slight	Loblolly pine----- Shortleaf pine-----	70 60	Loblolly pine, shortleaf pine.
110: Carnasaw part---	3x9	Severe	Severe	Moderate	Shortleaf pine----- Southern red oak-----	70 --	Shortleaf pine, loblolly pine.
Townley part---	4r2	Moderate	Moderate	Slight	Loblolly pine----- Shortleaf pine-----	70 60	Loblolly pine, shortleaf pine.
111: Carnasaw part---	3o1	Slight	Slight	Slight	Shortleaf pine----- Loblolly pine-----	70 80	Loblolly pine, shortleaf pine.
Pirum part-----	3o7	Slight	Slight	Slight	Loblolly pine----- Shortleaf pine----- Southern red oak----- White oak-----	80 70 70 70	Loblolly pine, shortleaf pine, southern red oak.
Townley part---	4o1	Slight	Slight	Slight	Loblolly pine----- Shortleaf pine-----	70 60	Loblolly pine, shortleaf pine.

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Wood-land suitability group	Management concerns			Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Important trees	Site index	
Carnasaw: 12: Carnasaw part---	3x9	Severe	Severe	Moderate	Shortleaf pine----- Southern red oak-----	70 ---	Shortleaf pine, loblolly pine.
Townley part----	4r2	Moderate	Moderate	Slight	Loblolly pine----- Shortleaf pine-----	70 60	Loblolly pine.
Pirum part-----	3o7	Slight	Slight	Slight	Loblolly pine----- Shortleaf pine----- Southern red oak----- White oak-----	80 70 70 70	Loblolly pine, shortleaf pine, southern red oak.
Leadvale: 13, 14-----	3o7	Slight	Slight	Slight	Southern red oak---- Loblolly pine----- Shortleaf pine-----	60 80 70	Loblolly pine, shortleaf pine.
Linker: 15-----	4o7	Slight	Slight	Slight	Shortleaf pine----- Southern red oak---- White oak----- Eastern redcedar---- Loblolly pine-----	60 50 50 40 ---	Loblolly pine, shortleaf pine, eastern redcedar.
Ouachita: 16-----	1w8	Slight	Moderate	Slight	Loblolly pine----- Sweetgum----- Eastern cottonwood--	100 100 100	Loblolly pine, sweetgum, Nuttall oak, American sycamore, eastern cottonwood.
117: Ouachita part---	1w8	Slight	Moderate	Slight	Loblolly pine----- Sweetgum----- Eastern cottonwood--	100 100 100	Loblolly pine, sweetgum, Nuttall oak, yellow-poplar, American sycamore, eastern cottonwood.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Wood-land suitability group	Management concerns			Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Important trees	Site index	
Savannah: Urban land part.							
¹²³ : Savannah part---	3o7	Slight	Slight	Slight	Loblolly pine----- Shortleaf pine----- Sweetgum----- Southern red oak----	81 76 80 75	Loblolly pine.
Urban land part.							
Sherwood: ¹²⁴ : Sherwood part---	4o7	Slight	Slight	Slight	Shortleaf pine----- Southern red oak---- White oak----- Sweetgum-----	60 60 55 60	Shortleaf pine, southern red oak, eastern redcedar.
Rock outcrop part.							
Smithdale: 25, 27-----	3o1	Slight	Slight	Slight	Loblolly pine----- Shortleaf pine-----	80 69	Loblolly pine, shortleaf pine.
¹²⁶ : Smithdale part--	3o1	Slight	Slight	Slight	Loblolly pine----- Shortleaf pine-----	80 69	Loblolly pine, shortleaf pine.
Urban land part.							
¹²⁸ : Smithdale part--	3o1	Slight	Slight	Slight	Loblolly pine----- Shortleaf pine-----	80 69	Loblolly pine.
Darco part-----	4s3	Slight	Moderate	Severe	Loblolly pine----- Shortleaf pine-----	70 65	Loblolly pine, shortleaf pine.
Tiak: 29, 31-----	3c2	Slight	Moderate	Moderate	Loblolly pine----- Shortleaf pine-----	80 70	Loblolly pine, shortleaf pine.
¹³⁰ : Tiak part-----	3c2	Slight	Moderate	Moderate	Loblolly pine----- Shortleaf pine-----	80 70	Loblolly pine, shortleaf pine.
Urban land part.							
Udorthents: 32-----	5r9	Severe	Severe	Slight	Shortleaf pine----- Sweetgum----- Loblolly pine-----	50 --- ---	Shortleaf pine, loblolly pine, eastern redcedar.
Wrightsville: 33-----	3w9	Slight	Severe	Moderate	Loblolly pine----- Sweetgum----- Water oak-----	80 80 80	Loblolly pine, sweetgum, water oak, willow oak.
Zafra: ¹³⁴ : Zafra part-----	3o7	Slight	Slight	Slight	Shortleaf pine----- Southern red oak----	70 70	Shortleaf pine.

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Wood-land suitability group	Management concerns			Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Important trees	Site index	
Zafra: Leadvale part---	3o7	Slight	Slight	Slight	Yellow-poplar----- Southern red oak---- Loblolly pine----- Shortleaf pine-----	90 60 80 70	Loblolly pine, shortleaf pine.

¹This map unit is made up of two or more dominant kinds of soil. See map unit description for the composition and behavior of the whole map unit.

TABLE 9.--BUILDING SITE DEVELOPMENT

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry means soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Allen: 1-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Amy: 2, 14-----	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
3-----	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.
Angie: 5-----	Moderate: wetness, too clayey.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength.	Moderate: shrink-swell, low strength, slope.	Severe: low strength.
Avilla: 6-----	Slight-----	Slight-----	Slight-----	Slight-----	Moderate: low strength.
7-----	Slight-----	Slight-----	Slight-----	Moderate: slope.	Moderate: low strength.
Caddo Variant: 18:					
Caddo part-----	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Messer part-----	Moderate: wetness.	Slight-----	Moderate: wetness.	Slight-----	Moderate: low strength.
Carnasaw: 19:					
Carnasaw part--	Severe: too clayey.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.
Townley part---	Moderate: depth to rock, slope.	Moderate: low strength, slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope.
110:					
Carnasaw part--	Severe: too clayey, slope, large stones.	Severe: shrink-swell, low strength, slope.	Severe: shrink-swell, low strength, slope.	Severe: shrink-swell, low strength, slope.	Severe: shrink-swell, low strength, slope.
Townley part---	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
111:					
Carnasaw part--	Severe: too clayey.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.	Severe: shrink-swell, low strength.
Pirum part-----	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Moderate: depth to rock, low strength.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Carnasaw: Townley part---	Moderate: depth to rock, slope.	Moderate: low strength, slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope.
¹¹² : Carnasaw part--	Severe: too clayey, slope, large stones.	Severe: shrink-swell, low strength, slope.	Severe: shrink-swell, low strength, slope.	Severe: shrink-swell, low strength, slope.	Severe: shrink-swell, low strength, slope.
Townley part---	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Pirum part-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: slope, depth to rock.
Leadvale: 13-----	Moderate: wetness.	Slight-----	Moderate: wetness.	Moderate: low strength.	Moderate: low strength.
14-----	Moderate: wetness.	Slight-----	Moderate: wetness.	Moderate: slope, low strength.	Moderate: low strength.
Linker: 15-----	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Moderate: depth to rock.
Ouachita: 16-----	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
¹¹⁷ : Ouachita part--	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
Amy part-----	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.
Saffell: 18-----	Severe: small stones.	Slight-----	Slight-----	Moderate: slope.	Slight.
¹¹⁹ : Saffell part--	Severe: small stones.	Slight-----	Slight-----	Moderate: slope.	Slight.
Urban land part.					
Savannah: 20-----	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, corrosive.	Moderate: low strength.
¹²¹ : Savannah part--	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, corrosive.	Moderate: low strength.
Urban land part.					

See footnote at end of table.

SOIL SURVEY

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Savannah: 22-----	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, slope, corrosive.	Moderate: low strength.
123: Savannah part--	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, slope, corrosive.	Moderate: low strength.
Urban land part.					
Sherwood: 124: Sherwood part--	Slight-----	Moderate: low strength.	Moderate: low strength.	Moderate: low strength, slope.	Moderate: low strength.
Rock outcrop part.					
Smithdale: 25-----	Slight-----	Slight-----	Slight-----	Moderate: slope.	Slight.
126: Smithdale part--	Slight-----	Slight-----	Slight-----	Moderate: slope.	Slight.
Urban land part.					
27-----	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
128: Smithdale part--	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Darco part----	Severe: cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Tiak: 29, 31-----	Severe: wetness, too clayey.	Severe: shrink-swell, low strength, wetness.	Severe: shrink-swell, wetness, low strength.	Severe: shrink-swell, wetness, low strength.	Severe: shrink-swell, wetness, low strength.
130: Tiak part-----	Severe: wetness, too clayey.	Severe: shrink-swell, low strength, wetness.	Severe: shrink-swell, wetness, low strength.	Severe: shrink-swell, wetness, low strength.	Severe: shrink-swell, wetness, low strength.
Urban land part.					
Udorthents: 32-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Wrightsville: 33-----	Severe: wetness, too clayey.	Severe: wetness, low strength, shrink-swell.	Severe: wetness, low strength, shrink-swell.	Severe: wetness, low strength, shrink-swell.	Severe: wetness, low strength, shrink-swell.
Zafra: 134: Zafra part-----	Moderate: depth to rock.	Slight-----	Moderate: depth to rock.	Moderate: slope.	Moderate: depth to rock.
Leadvale part--	Moderate: wetness.	Slight-----	Moderate: wetness.	Moderate: slope, low strength.	Moderate: low strength.

¹This map unit is made up of two or more dominant kinds of soil. See map unit description for the composition and behavior of the whole map unit.

SOIL SURVEY

TABLE 10.--SANITARY FACILITIES

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms used to rate soils. Absence of an entry means soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Allen: 1-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Amy: 2, 14-----	Severe: percs slowly, wetness.	Slight-----	Severe: wetness.	Severe: wetness.	Poor: wetness.
3-----	Severe: floods, percs slowly, wetness.	Severe: floods.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness.
Angie: 5-----	Severe: percs slowly.	Moderate: wetness, slope.	Severe: wetness, too clayey.	Moderate: wetness.	Poor: too clayey.
Avilla: 6, 7-----	Moderate: percs slowly.	Moderate: slope, seepage.	Moderate: too clayey.	Slight-----	Good.
Caddo Variant: 18: Caddo part-----	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Messer part-----	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight-----	Fair: too clayey.
Carnasaw: 19: Carnasaw part-----	Severe: percs slowly.	Moderate: depth to rock, slope.	Severe: too clayey.	Slight-----	Poor: too clayey.
Townley part-----	Severe: depth to rock.	Severe: depth to rock, slope.	Moderate: depth to rock.	Moderate: slope.	Fair: thin layer, slope.
110: Carnasaw part-----	Severe: percs slowly, slope, large stones.	Severe: slope, large stones.	Severe: too clayey, slope, large stones.	Severe: slope.	Poor: too clayey, slope, large stones.
Townley part-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Poor: slope.
111: Carnasaw part-----	Severe: percs slowly.	Moderate: depth to rock, slope.	Severe: too clayey.	Slight-----	Poor: too clayey.
Pirum part-----	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight-----	Fair: thin layer.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Carnasaw: Townley part-----	Severe: depth to rock.	Severe: depth to rock, slope.	Moderate: depth to rock.	Moderate: slope.	Fair: thin layer, slope.
112: Carnasaw part-----	Severe: percs slowly, slope, large stones.	Severe: slope, large stones.	Severe: too clayey, slope, large stones.	Severe: slope.	Poor: too clayey, slope, large stones.
Townley part-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Poor: slope.
Pirum part-----	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Poor: slope, thin layer.
Leadvale: 13, 14-----	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey, wetness.	Slight-----	Fair: too clayey, hard to pack.
Linker: 15-----	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight-----	Fair: thin layer.
Ouachita: 16-----	Severe: floods, percs slowly.	Severe: floods.	Severe: floods.	Severe: floods.	Fair: too clayey.
117: Ouachita part-----	Severe: floods, percs slowly.	Severe: floods.	Severe: floods.	Severe: floods.	Fair: too clayey.
Amy part-----	Severe: floods, percs slowly, wetness.	Severe: floods.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness.
Saffell: 18-----	Slight-----	Moderate: slope, seepage.	Slight-----	Slight-----	Poor: small stones.
119: Saffell part-----	Slight-----	Moderate: slope, seepage.	Slight-----	Slight-----	Poor: small stones.
Urban land part.					
Savannah: 20-----	Severe: percs slowly.	Slight-----	Slight-----	Slight-----	Good.
121: Savannah part-----	Severe: percs slowly.	Slight-----	Slight-----	Slight-----	Good.
Urban land part.					

SOIL SURVEY

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Savannah: 123: Savannah part----- Urban land part.	Severe: percs slowly.	Moderate: slope.	Slight-----	Slight-----	Good.
Sherwood: 124: Sherwood part----- Rock outcrop part.	Moderate: percs slowly.	Severe: slope.	Moderate: depth to rock.	Slight-----	Fair: small stones.
Smithdale: 25-----	Slight-----	Severe: seepage, slope.	Slight-----	Slight-----	Good.
126: Smithdale part----- Urban land part.	Slight-----	Severe: seepage, slope.	Slight-----	Slight-----	Good.
27-----	Moderate: slope.	Severe: seepage, slope.	Slight-----	Moderate: slope.	Fair: slope.
128: Smithdale part----- Darco part-----	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: slope.	Poor: slope.
Tiak: 29, 31-----	Severe: percs slowly, wetness.	Severe: slope.	Severe: too clayey, wetness.	Severe: wetness.	Poor: too clayey.
130: Tiak part----- Urban land part.	Severe: percs slowly, wetness.	Severe: slope.	Severe: too clayey, wetness.	Severe: wetness.	Poor: too clayey.
Udorthents: 32-----	Severe: slope.	Severe: slope, seepage.	Severe: slope, seepage.	Severe: slope, seepage.	Poor: slope.
Wrightsville: 33-----	Severe: wetness, percs slowly.	Slight-----	Severe: wetness, too clayey.	Severe: wetness.	Poor: wetness, too clayey.
Zafra: 134: Zafra part-----	Severe: depth to rock.	Moderate: seepage, depth to rock.	Severe: depth to rock.	Slight-----	Poor: small stones.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Zafra: Leadvale part----	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey, wetness.	Slight-----	Fair: too clayey, hard to pack.

¹This map unit is made up of two or more dominant kinds of soil. See map unit description for the composition and behavior of the whole map unit.

TABLE 11.--CONSTRUCTION MATERIALS

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," and "unsuited." Absence of an entry means soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Allen: 1-----	Poor: slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
Amy: 2, 3, 14-----	Poor: wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Angie: 5-----	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Avilla: 6, 7-----	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Caddo Variant: 18: Caddo part-----	Poor: wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Messer part-----	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Carnasaw: 19: Carnasaw part-----	Poor: shrink-swell, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer, small stones.
Townley part-----	Poor: low strength, thin layer.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, area reclaim.
110: Carnasaw part-----	Poor: shrink-swell, low strength, slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, large stones.
Townley part-----	Poor: low strength, thin layer.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, area reclaim.
111: Carnasaw part-----	Poor: shrink-swell, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer, small stones.
Pirum part-----	Fair: low strength, thin layer.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Townley part-----	Poor: low strength, thin layer.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, area reclaim.
112: Carnasaw part-----	Poor: shrink-swell, low strength, slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, large stones.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Carnasaw: Tomblow part				
Pirum part-----	low strength, thin layer. Fair: low strength, thin layer.	excess fines. Unsuited: excess fines.	excess fines. Unsuited: excess fines.	thin layer, area reclaim. Poor: slope, thin layer.
Leadvale: 13, 14-----	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer, area reclaim.
Linker: 15-----	Fair: low strength, thin layer.	Poor: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Ouachita: 16-----	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
117: Ouachita part-----	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Amy part-----	Poor: wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Saffell: 18-----	Good-----	Poor: excess fines.	Fair: excess fines.	Poor: small stones.
119: Saffell part-----	Good-----	Poor: excess fines.	Fair: excess fines.	Poor: small stones.
Urban land part.				
Savannah: 20, 22-----	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
121: Savannah part-----	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Urban land part.				
123: Savannah part-----	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Urban land part.				

SOIL SURVEY

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Smithdale: Urban land part.				
27-----	Good-----	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope.
^{128:} Smithdale part-----	Poor: slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
Darco part-----	Fair: slope.	Poor: excess fines.	Unsuited: excess fines.	Poor: too sandy, slope.
Tiak: 29, 31-----	Poor: low strength, wetness, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
^{130:} Tiak part-----	Poor: low strength, wetness, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Urban land part.				
Udorthents: 32-----	Poor: slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
Wrightsville: 33-----	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Zafra: ^{134:} Zafra part-----	Fair: thin layer.	Unsuited: excess fines.	Poor: excess fines.	Fair: thin layer, small stones.
Leadvale part-----	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer, area reclaim.

¹This map unit is made up of two or more dominant kinds of soil. See map unit description for the composition and behavior of the whole map unit.

TABLE 12.--WATER MANAGEMENT

Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions.

of "slight," "moderate," and "severe." Absence of an entry means soil was not evaluated]

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Allen: 1-----	Moderate: seepage.	Slight-----	Severe: no water.	Not needed-----	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Amy: 2, 14-----	Slight-----	Moderate: compressible, low strength, piping.	Severe: no water.	Percs slowly, wetness.	Slow intake, percs slowly, wetness.	Percs slowly, wetness.	Percs slowly, wetness.
3-----	Slight-----	Moderate: compressible, low strength, piping.	Severe: no water.	Floods, percs slowly, wetness.	Slow intake, percs slowly, wetness.	Percs slowly, wetness.	Percs slowly, wetness.
Angie: 5-----	Slight-----	Moderate: low strength, shrink-swell, compressible.	Severe: no water.	Not needed-----	Slope, percs slowly.	Percs slowly---	Favorable.
Avilla: 6-----	Moderate:	Moderate:	Severe:	Not needed-----	Favorable-----	Favorable-----	Favorable.

SOIL SURVEY

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Carnasaw: 10:							
Carnasaw part--	Moderate: depth to rock.	Severe: large stones.	Severe: deep to water.	Not needed----	Slow intake, erodes easily.	Percs slowly, slope.	Percs slowly, slope.
Townley part---	Moderate: depth to rock.	Moderate: thin layer.	Severe: no water.	Not needed----	Droughty, slope.	Depth to rock, rooting depth, slope.	Droughty, rooting depth, slope.
11:							
Carnasaw part--	Moderate: depth to rock.	Moderate: thin layer, compressible, unstable fill.	Severe: deep to water.	Not needed----	Slow intake, erodes easily.	Percs slowly, slope.	Percs slowly, slope.
Pirum part----	Severe: depth to rock.	Moderate: thin layer, compressible, low strength.	Severe: no water.	Not needed----	Complex slope, erodes easily, slope.	Slope, depth to rock, erodes easily.	Erodes easily, slope.
Townley part---	Moderate: depth to rock.	Moderate: thin layer.	Severe: no water.	Not needed----	Droughty, slope.	Depth to rock, rooting depth, slope.	Droughty, rooting depth, slope.
12:							
Carnasaw part--	Moderate: depth to rock.	Severe: large stones.	Severe: deep to water.	Not needed----	Slow intake, erodes easily.	Percs slowly, slope.	Percs slowly, slope.
Townley part---	Moderate: depth to rock.	Moderate: thin layer.	Severe: no water.	Not needed----	Droughty, slope.	Depth to rock, rooting depth, slope.	Droughty, rooting depth, slope.
Pirum part----	Severe: depth to rock.	Moderate: thin layer, compressible, low strength.	Severe: no water.	Not needed----	Complex slope, erodes easily, slope.	Slope, depth to rock, erodes easily.	Erodes easily, slope.
Leadvale: 13, 14-----	Slight-----	Moderate:	Severe:	Percs slowly---	Favorable-----	Favorable-----	Favorable.
15-----	Severe: depth to rock.	Moderate: thin layer, compressible.	Severe: no water.	Not needed----	Slope, erodes easily.	Slope, depth to rock, erodes easily.	Erodes easily, slope.
Ouachita: 16-----	Moderate:	Moderate:	Severe:	Not needed----	Floods-----	Not needed----	Not needed.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Quachita: Amy part-----	Slight-----	Moderate: compressible, low strength, piping.	Severe: no water.	Floods, percs slowly, wetness.	Slow intake, percs slowly, wetness.	Percs slowly, wetness.	Percs slowly, wetness.
Saffell: 18-----	Moderate: seepage.	Moderate: seepage, piping, thin layer.	Severe: no water.	Not needed----	Droughty, fast intake, slope.	Erodes easily, slope, small stones.	Droughty, erodes easily, slope.
119: Saffell part--	Moderate: seepage.	Moderate: seepage, piping, thin layer.	Severe: no water.	Not needed----	Droughty, fast intake, slope.	Erodes easily, slope, small stones.	Droughty, erodes easily, slope.
Urban land part.							
Savannah: 20-----	Moderate: seepage.	Moderate: low strength, piping.	Severe: deep to water.	Percs slowly, slope.	Percs slowly---	Percs slowly, erodes easily.	Percs slowly.
121: Savannah part--	Moderate: seepage.	Moderate: low strength, piping.	Severe: deep to water.	Percs slowly, slope.	Percs slowly---	Percs slowly, erodes easily.	Percs slowly.
Urban land part.							
22-----	Moderate: seepage.	Moderate: low strength, piping.	Severe: deep to water.	Percs slowly, slope.	Percs slowly---	Percs slowly, erodes easily.	Percs slowly.
123: Savannah part--	Moderate: seepage.	Moderate: low strength, piping.	Severe: deep to water.	Percs slowly, slope.	Percs slowly---	Percs slowly, erodes easily.	Percs slowly.
Urban land part.							
Sherwood: 124: Sherwood part--	Moderate: seepage, depth to rock.	Moderate: thin layer, unstable fill.	Severe: deep to water.	Not needed----	Slope-----	Slope-----	Slope.
Rock outcrop part.							

See footnote at end of table.

SOIL SURVEY

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Smithdale: 25-----	Severe: seepage.	Moderate: piping, unstable fill.	Severe: no water.	Not needed, slope.	Fast intake, seepage, complex slope.	Favorable-----	Favorable.
¹ 26: Smithdale part	Severe: seepage.	Moderate: piping, unstable fill.	Severe: no water.	Not needed, slope.	Fast intake, seepage, complex slope.	Favorable-----	Favorable.
Urban land part.							
27-----	Severe: seepage.	Moderate: piping, unstable fill.	Severe: no water.	Not needed, slope.	Fast intake, seepage, complex slope.	Slope, erodes easily.	Slope, erodes easily.
¹ 28: Smithdale part	Severe: seepage.	Moderate: piping, unstable fill.	Severe: no water.	Not needed, slope.	Fast intake, seepage, complex slope.	Slope, erodes easily.	Slope, erodes easily.
Darco part-----	Severe: seepage.	Moderate: seepage, piping.	Severe: no water.	Not needed-----	Droughty, fast intake, soil blowing.	Slope, piping, erodes easily.	Droughty, erodes easily.
Tiak: 29-----	Slight-----	Moderate: unstable fill, compressible.	Severe: no water.	Favorable-----	Slow intake-----	Favorable-----	Favorable.
¹ 30: Tiak part-----	Slight-----	Moderate: unstable fill, compressible.	Severe: no water.	Favorable-----	Slow intake-----	Favorable-----	Favorable.
Urban land part.							
31-----	Slight-----	Moderate: unstable fill, compressible.	Severe: no water.	Favorable-----	Slow intake-----	Slope-----	Favorable.
Udorthents: 32-----	Severe: seepage.	Moderate: unstable fill.	Severe: no water.	Not needed-----	Slope-----	Complex slope	Slope.
Wrightsville: 33-----	Slight-----	Severe: unstable fill, compressible.	Severe: no water.	Favorable, wetness, percs slowly.	Favorable, wetness, slow intake.	Not needed-----	Not needed.
Zafra: ¹ 34: Zafra part-----	Severe: depth to rock.	Moderate: thin layer.	Severe: deep to water.	Not needed-----	Erodes easily, rooting depth, slope.	Depth to rock, rooting depth.	Erodes easily, rooting depth.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Zafra: Leadvale part--	Slight-----	Moderate: piping.	Severe: no water.	Percs slowly---	Favorable-----	Favorable-----	Favorable.

¹This map unit is made up of two or more dominant kinds of soil. See map unit description for the composition and behavior of the whole map unit.

SOIL SURVEY

TABLE 13.--RECREATIONAL DEVELOPMENT

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry means soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
Allen: 1-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Amy: 2, 14-----	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
3-----	Severe: floods, wetness.	Severe: wetness.	Severe: floods, wetness.	Severe: wetness.
Angie: 5-----	Moderate: percs slowly.	Slight-----	Moderate: percs slowly, slope.	Slight.
Avilla: 6, 7-----	Slight-----	Slight-----	Moderate: slope.	Slight.
Caddo Variant: 18:				
Caddo part-----	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Messer part-----	Slight-----	Slight-----	Moderate: slope.	Slight.
Carnasaw: 19:				
Carnasaw part-----	Moderate: percs slowly.	Slight-----	Moderate: percs slowly.	Slight.
Townley part-----	Moderate: slope, percs slowly.	Moderate: slope.	Severe: slope.	Slight.
110: Carnasaw part-----	Severe: slope, large stones.	Severe: slope.	Severe: slope.	Severe: slope, large stones.
Townley part-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
111: Carnasaw part-----	Moderate: percs slowly.	Slight-----	Moderate: percs slowly.	Slight.
Pirum part-----	Slight-----	Slight-----	Moderate: slope.	Slight.
Townley part-----	Moderate: slope, percs slowly.	Moderate: slope.	Severe: slope.	Slight.
112: Carnasaw part-----	Severe: slope, large stones.	Severe: slope.	Severe: slope.	Severe: slope, large stones.

See footnote at end of table.

TABLE 13.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
Carnasaw: Townley part-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Pirum part-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Leadvale: 13-----	Moderate: percs slowly.	Slight-----	Moderate: slope, percs slowly.	Slight.
14-----	Moderate: percs slowly.	Slight-----	Severe: slope.	Slight.
Linker: 15-----	Slight-----	Slight-----	Moderate: slope.	Slight.
Ouachita: 16-----	Severe: floods.	Moderate: floods.	Severe: floods.	Moderate: floods.
¹¹⁷ : Ouachita part-----	Severe: floods.	Moderate: floods.	Severe: floods.	Moderate: floods.
Amy part-----	Severe: floods, wetness.	Severe: wetness.	Severe: floods, wetness.	Severe: wetness.
Saffell: 18-----	Severe: small stones.	Moderate: small stones.	Severe: small stones, slope.	Moderate: small stones.
¹¹⁹ : Saffell part-----	Severe: small stones.	Moderate: small stones.	Severe: small stones, slope.	Moderate: small stones.
Urban land part.				
Savannah: 20-----	Slight-----	Slight-----	Slight-----	Slight.
¹²¹ : Savannah part-----	Slight-----	Slight-----	Slight-----	Slight.
Urban land part.				
22-----	Slight-----	Slight-----	Severe: slope.	Slight.
¹²³ : Savannah part-----	Slight-----	Slight-----	Severe: slope.	Slight.
Urban land part.				
Sherwood: ¹²⁴ : Sherwood part-----	Slight-----	Slight-----	Severe: slope.	Slight.
Rock outcrop part.				

See footnote at end of table.

TABLE 13.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
Smithdale: 25-----	Slight-----	Slight-----	Severe: slope.	Slight.
¹ 26: Smithdale part-----	Slight-----	Slight-----	Severe: slope.	Slight.
Urban land part.				
27-----	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
¹ 28: Smithdale part-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Darco part-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too sandy.
Tiak: 29-----	Moderate: percs slowly.	Slight-----	Moderate: percs slowly, slope.	Slight.
¹ 30: Tiak part-----	Moderate: percs slowly.	Slight-----	Moderate: percs slowly, slope.	Slight.
Urban land part.				
31-----	Moderate: percs slowly.	Slight-----	Moderate: percs slowly, slope.	Slight.
Udorthents: 32-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Wrightsville: 33-----	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, percs slowly.	Severe: wetness.
Zafra: ¹ 34: Zafra part-----	Slight-----	Slight-----	Moderate: slope, small stones.	Slight.
Leadvale part-----	Moderate: percs slowly.	Slight-----	Moderate: slope, percs slowly.	Slight.

¹This map unit is made up of two or more dominant kinds of soil. See map unit description for the composition and behavior of the whole map unit.

TABLE 14.--WILDLIFE HABITAT POTENTIALS

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates the soil was not rated]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--				
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
Allen: 1-----	Very poor.	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	---
Amy: 2, 14-----	Poor	Fair	Fair	Good	Fair	---	Good	Good	Fair	Good	Good	---
3-----	Poor	Fair	Fair	Good	Fair	---	Good	Poor	Fair	Good	Fair	---
Angie: 5-----	Good	Good	Good	---	Good	---	Poor	Very poor.	Good	Good	Very poor.	---
Avilla: 6, 7-----	Good	Good	Good	Good	---	---	Very poor.	Very poor.	Good	Good	Very poor	---
Caddo Variant: 18:												
Caddo part-----	Fair	Fair	Fair	---	Fair	---	Good	Good	Fair	Fair	Good	---
Messer part-----	Good	Good	Good	---	Good	---	Poor	Very poor.	Good	Good	Very poor.	---
Carnasaw: 19:												
Carnasaw part---	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
Townley part---	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
110:												
Carnasaw part---	Very poor.	Poor	Good	Good	Good	---	Very poor.	Very poor.	Poor	Good	Very poor.	---
Townley part---	Very poor.	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
111:												
Carnasaw part---	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
Pirum part-----	Fair	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.	---
Townley part---	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
112:												
Carnasaw part---	Very poor.	Poor	Good	Good	Good	---	Very poor.	Very poor.	Poor	Good	Very poor.	---
Townley part---	Very poor.	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
Pirum part-----	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
Leadvale: 13-----	Fair	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	---

See footnote at end of table.

TABLE 14.--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 herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
Leadvale: 14-----	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.	---
Linker: 15-----	Fair	Good	Good	Fair	Fair	---	Poor	Very poor.	Good	Good	Very poor.	---
Ouachita: 16-----	Poor	Fair	Fair	Good	Poor	---	Good	Fair	Fair	Good	Fair	---
117: Ouachita part---	Poor	Fair	Fair	Good	Poor	---	Good	Fair	Fair	Good	Fair	---
Amy part-----	Poor	Fair	Fair	Good	Fair	---	Good	Poor	Fair	Good	Fair	---
Saffell: 18-----	Fair	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
119: Saffell part---	Fair	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
Urban land part.												
Savannah: 20-----	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.	---
121: Savannah part---	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.	---
Urban land part.												
22-----	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
123: Savannah part---	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
Urban land part.												
Sherwood: 124: Sherwood part---	Fair	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.	---
Rock outcrop part.												
Smithdale: 25, 27-----	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
126: Smithdale part---	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
Urban land part.												
128: Smithdale part---	Very poor.	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---

See footnote at end of table.

TABLE 15.--ENGINEERING PROPERTIES AND CLASSIFICATIONS

[The symbol < means less than; > means greater than. Absence of an entry means data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	<u>In</u>				<u>Pct</u>					<u>Pct</u>	
Allen: 1-----	0-9	Loam, fine sandy loam.	ML, CL-ML, SM, SM-SC	A-4	0-5	90-100	75-100	65-98	40-80	14-26	2-7
	9-23	Clay loam, sandy clay loam, loam.	CL-ML, CL	A-4, A-6, A-7	0-10	85-100	75-100	65-98	50-80	22-43	5-19
	23-72	Clay loam, sandy clay loam, clay.	CL-ML, CL, SC, SM-SC	A-4, A-6, A-7	0-10	85-100	70-95	60-95	45-80	22-48	6-22
Amy: 2, 3, 14-----	0-45	Silt loam-----	ML, CL-ML	A-4	0	100	95-100	90-100	70-95	<30	NP-5
	45-72	Silt loam, silty clay loam.	CL	A-4, A-6	0	100	95-100	95-100	85-95	25-40	8-20
Angie: 5-----	0-10	Fine sandy loam	SM, ML	A-4	0	100	100	85-100	36-75	---	NP
	10-72	Silty clay, silty clay loam.	CH, CL	A-7, A-6	0	100	100	90-100	80-90	35-55	15-30
Avilla: 6, 7-----	0-9	Silt loam-----	ML, CL-ML, CL	A-4	0	100	85-100	80-90	60-80	<23	NP-10
	9-56	Loam, clay loam, sandy clay loam.	CL, SC, CL-ML	A-6, A-4	0	100	85-100	80-90	45-80	23-38	7-15
	56-72	Very gravelly loam, very gravelly clay loam, very gravelly sandy clay loam.	SC, GC	A-2	0-10	40-60	20-50	15-35	12-20	23-38	7-15
Caddo Variant: 18:											
Caddo part-----	0-10	Silt loam-----	ML, CL-ML	A-4	0	100	100	95-100	70-95	<27	NP-7
	10-72	Silt loam, loam, silty clay loam.	CL	A-6	0	100	100	85-100	50-90	30-40	11-18
Messer part-----	0-42	Silt loam-----	ML, CL-ML	A-4	0	100	100	95-100	80-95	<25	NP-5
	42-72	Very gravelly loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-70	20-25	15-20	20-40	4-18
Carnasaw: 19:											
Carnasaw part---	0-3	Gravelly silt loam.	SM, ML, SM-SC, GM-GC	A-2, A-1, A-4	0-10	55-75	55-75	40-70	20-70	<20	NP-7
	3-6	Silty clay loam, clay loam, clay.	CL, CH	A-6, A-7	0	85-100	83-97	80-95	70-95	37-65	16-35
	6-40	Clay, silty clay	CL, CH, MH	A-7	0	85-100	83-97	80-96	75-97	41-67	18-35
	40-72	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Townley part----	0-6	Silt loam-----	ML, CL	A-4	0-2	80-98	70-95	65-90	50-65	<35	NP-10
	6-23	Silty clay loam, silty clay, clay.	CL, CH	A-6, A-7	0-2	80-100	80-100	75-99	70-95	30-55	12-30
	23-25	Weathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

SOIL SURVEY

TABLE 15.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Leadvale: 13, 14-----	0-5	Silt loam-----	ML, CL-ML, CL	A-4	0	100	95-100	85-95	65-85	18-32	2-10
	5-27	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	100	95-100	90-98	75-90	24-36	5-14
	27-49	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6, A-7	0	100	95-100	80-98	70-90	24-42	5-18
	49-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Linker: 15-----	0-5	Fine sandy loam	SM, ML, GM, CL-ML	A-2, A-4	0-5	65-100	60-100	55-100	25-70	<30	NP-7
	5-33	Fine sandy loam, sandy clay loam, clay loam.	CL, SC, SM, ML	A-4, A-6	0-10	90-100	80-100	70-100	40-80	<40	NP-18
	33-35	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Ouachita: 16-----	0-11	Silt loam-----	ML, CL, CL-ML	A-4, A-6	0	100	100	85-100	75-95	<30	NP-12
	11-72	Silt loam, loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	100	100	85-100	80-100	25-40	5-20
^{117:} Ouachita part---	0-11	Silt loam-----	ML, CL, CL-ML	A-4, A-6	0	100	100	85-100	75-95	<30	NP-12
	11-72	Silt loam, loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	100	100	85-100	80-100	25-40	5-20
Amy part-----	0-45	Silt loam-----	ML, CL-ML	A-4	0	100	95-100	90-100	70-95	<30	NP-5
	45-72	Silt loam, silty clay loam.	CL	A-4, A-6	0	100	95-100	95-100	85-95	25-40	8-20
Saffell: 18-----	0-9	Gravelly fine sandy loam.	GM, SM	A-1, A-2, A-4	0-5	70-80	50-75	40-65	25-40	<20	NP-3
	9-36	Very gravelly sandy clay loam, very gravelly fine sandy loam, very gravelly loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-70	20-55	15-35	20-40	4-18
	36-76	Gravelly sandy loam, very gravelly loam, very gravelly loamy coarse sand.	GM, GC, SM, SC	A-1, A-2, A-3	0-5	25-80	10-70	5-60	5-35	<35	NP-15
^{119:} Saffell part----	0-9	Gravelly fine sandy loam.	GM, SM	A-1, A-2, A-4	0-5	70-80	50-75	40-65	25-40	<20	NP-3
	9-36	Very gravelly sandy clay loam, very gravelly fine sandy loam, very gravelly loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-70	20-55	15-35	20-40	4-18
	36-76	Gravelly sandy loam, very gravelly sandy loam, gravelly loamy sand.	GM, GC, SM, SC	A-1, A-2, A-3	0-5	25-80	10-70	5-60	5-35	<35	NP-15

See footnote at end of table.

TABLE 15.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Saffell: Urban land part.											
Savannah: 20, 22-----	0-14	Fine sandy loam	SM, ML	A-2, A-4	0	100	100	60-85	30-55	<25	NP-4
	14-32	Sandy clay loam, clay loam, loam.	CL, SC, CL-ML	A-4, A-6	0	100	100	80-100	40-80	23-40	7-19
	32-72	Loam, clay loam, sandy clay loam.	CL, SC, CL-ML	A-4, A-6, A-7	0	100	100	80-100	40-80	23-43	7-19
¹²¹ : Savannah part---	0-14	Fine sandy loam	SM, ML	A-2, A-4	0	100	100	60-85	30-55	<25	NP-4
	14-32	Sandy clay loam, clay loam, loam.	CL, SC, CL-ML	A-4, A-6	0	100	100	80-100	40-80	23-40	7-19
	32-72	Loam, clay loam, sandy clay loam.	CL, SC, CL-ML	A-4, A-6, A-7	0	100	100	80-100	40-80	23-43	7-19
Urban land part.											
¹²³ : Savannah part---	0-14	Fine sandy loam	SM, ML	A-2, A-4	0	100	100	60-85	30-55	<25	NP-4
	14-32	Sandy clay loam, clay loam, loam.	CL, SC, CL-ML	A-4, A-6	0	100	100	80-100	40-80	23-40	7-19
	32-72	Loam, clay loam, sandy clay loam.	CL, SC, CL-ML	A-4, A-6, A-7	0	100	100	80-100	40-80	23-43	7-19
Urban land part.											
Sherwood: ¹²⁴ : Sherwood part---	0-16	Loam-----	ML, CL, SM, SC	A-4	0	80-100	75-100	70-100	45-65	<30	NP-10
	16-40	Loam, clay loam, sandy clay loam.	CL, SC	A-4, A-6	0	70-97	65-97	60-90	45-65	25-40	8-18
	40-61	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop part.											
Smithdale: 25, 27-----	0-15	Loamy sand, fine sandy loam.	SM	A-2, A-3	0	100	85-100	50-75	15-30	---	NP
	15-26	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
	26-99	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-80	36-70	<30	NP-10
¹²⁶ : Smithdale part--	0-15	Loamy sand-----	SM	A-2, A-3	0	100	85-100	50-75	15-30	---	NP
	15-26	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
	26-80	Loam, fine sandy loam.	SM, ML, CL, SC	A-4	0	100	85-100	65-80	36-70	<30	NP-10
Urban land part.											

See footnote at end of table.

EMERGING PROPERTIES AND CLASSIFICATIONS Continued

The table contains multiple rows of data, but the content is almost entirely obscured by heavy black redaction bars. Only faint outlines of text and column structures are visible. The table appears to have several columns, but the specific data points within each cell are illegible due to the redaction.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol < means less than; > means greater than. The erosion tolerance factor (T) is for the entire profile. Absence of an entry means data were not available or were not estimated]

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Risk of corrosion		Erosion factors		Wind erodibility group
							Uncoated steel	Concrete	K	T	
	In	In/hr	In/in	pH	Mmhos/cm						
Allen:											
1-----	0-9	0.6-2.0	0.14-0.19	4.5-5.5	<2	Low-----	Low-----	Moderate	0.24	5	---
	9-23	0.6-2.0	0.15-0.18	4.5-5.5	<2	Low-----	Low-----	Moderate	0.20		
	23-72	0.6-2.0	0.12-0.17	4.5-5.5	<2	Low-----	Low-----	Moderate	0.20		
Amy:											
2, 3, 14-----	0-45	0.6-2.0	0.13-0.24	4.5-5.5	<2	Low-----	High-----	Moderate	0.43	5	---
	45-72	0.06-0.2	0.16-0.24	4.5-5.5	<2	Low-----	High-----	Moderate	0.43		
Angie:											
5-----	0-10	0.6-2.0	0.14-0.16	5.5-6.5	<2	Low-----	Low-----	Moderate	0.32	3	---
	10-72	0.06-0.2	0.18-0.20	4.5-5.5	<2	Moderate	High-----	High-----	0.32		
Avilla:											
6, 7-----	0-9	0.6-2.0	0.10-0.24	4.5-6.5	<2	Low-----	Low-----	Low-----	0.24	4	---
	9-56	0.6-2.0	0.12-0.20	4.5-5.5	<2	Low-----	Low-----	Moderate	0.28		
	56-72	2.0-6.0	0.04-0.12	4.5-5.5	<2	Low-----	Low-----	Moderate	0.20		
Caddo Variant:											
18:											
Caddo part-----	0-10	0.6-2.0	0.18-0.23	4.5-6.0	<2	Low-----	High-----	Moderate	0.43	3	---
	10-72	0.06-0.2	0.20-0.22	4.5-6.0	<2	Low-----	High-----	Moderate	0.37		
Messer part-----	0-42	0.6-2.0	0.16-0.20	4.5-6.0	<2	Low-----	High-----	Moderate	0.43	4	---
	42-72	0.06-0.2	0.16-0.20	4.5-7.3	<2	Low-----	High-----	Moderate	0.37		
Carnasaw:											
19:											
Carnasaw part---	0-3	0.6-2.0	0.08-0.16	4.5-6.0	<2	Low-----	Low-----	High-----	0.43	3	---
	3-6	0.2-0.6	0.12-0.20	4.5-5.5	<2	High-----	Moderate	High-----	0.37		
	6-40	0.06-0.2	0.12-0.18	4.5-5.5	<2	High-----	High-----	High-----	0.32		
	40-72	---	---	---	---	---	---	---	---		
Townley part---	0-6	0.6-2.0	0.12-0.14	4.2-5.5	<2	Low-----	Moderate	High-----	0.37	3	---
	6-23	0.06-0.2	0.12-0.18	4.2-5.5	<2	Moderate	Moderate	High-----	0.32		
	23-25	---	---	---	---	---	---	---	---		
110:											
Carnasaw part---	0-3	0.6-2.0	0.08-0.16	4.5-6.0	<2	Low-----	Low-----	High-----	0.43	3	---
	3-6	0.2-0.6	0.12-0.20	4.5-5.5	<2	High-----	Moderate	High-----	0.37		
	6-40	0.06-0.2	0.12-0.18	4.5-5.5	<2	High-----	High-----	High-----	0.32		
	40-72	---	---	---	---	---	---	---	---		
Townley part---	0-6	0.6-2.0	0.12-0.14	4.2-5.5	<2	Low-----	Moderate	High-----	0.37	3	---
	6-23	0.06-0.2	0.12-0.18	4.2-5.5	<2	Moderate	Moderate	High-----	0.32		
	23-25	---	---	---	---	---	---	---	---		
111:											
Carnasaw part---	0-3	0.6-2.0	0.08-0.16	4.5-6.0	<2	Low-----	Low-----	High-----	0.43	3	---
	3-6	0.2-0.6	0.12-0.20	4.5-5.5	<2	High-----	Moderate	High-----	0.37		
	6-40	0.06-0.2	0.12-0.18	4.5-5.5	<2	High-----	High-----	High-----	0.32		
	40-72	---	---	---	---	---	---	---	---		
Pirum part-----	0-10	0.6-2.0	0.12-0.16	4.5-5.5	<2	Low-----	Low-----	High-----	0.24	3	---
	10-34	0.6-2.0	0.14-0.18	4.5-5.5	<2	Low-----	Low-----	High-----	0.32		
	34-36	---	---	---	---	---	---	---	---		
Townley part---	0-6	0.6-2.0	0.12-0.14	4.2-5.5	<2	Low-----	Moderate	High-----	0.37	3	---
	6-23	0.06-0.2	0.12-0.18	4.2-5.5	<2	Moderate	Moderate	High-----	0.32		
	23-25	---	---	---	---	---	---	---	---		
112:											
Carnasaw part---	0-3	0.6-2.0	0.08-0.16	4.5-6.0	<2	Low-----	Low-----	High-----	0.43	3	---
	3-6	0.2-0.6	0.12-0.20	4.5-5.5	<2	High-----	Moderate	High-----	0.37		
	6-40	0.06-0.2	0.12-0.18	4.5-5.5	<2	High-----	High-----	High-----	0.32		
	40-72	---	---	---	---	---	---	---	---		

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Risk of corrosion		Erosion factors		Wind erodibility group
							Uncoated steel	Concrete	K	T	
	In	In/hr	In/in	pH	Mmhos/cm						
Carnasaw: Townley part----	0-6	0.6-2.0	0.12-0.14	4.2-5.5	<2	Low-----	Moderate	High-----	0.37	3	---
	6-23	0.06-0.2	0.12-0.18	4.2-5.5	<2	Moderate	Moderate	High-----	0.32		
	23-25	---	---	---	---	---	---	---	---		
Pirum part-----	0-10	0.6-2.0	0.12-0.16	4.5-5.5	<2	Low-----	Low-----	High-----	0.24	3	---
	10-34	0.6-2.0	0.14-0.18	4.5-5.5	<2	Low-----	Low-----	High-----	0.32		
	34-36	---	---	---	---	---	---	---	---		
Leadvale: 13, 14-----	0-5	0.6-2.0	0.17-0.22	4.5-5.5	<2	Low-----	Moderate	Moderate	0.43	3	---
	5-27	0.6-2.0	0.17-0.20	4.5-5.5	<2	Low-----	Moderate	Moderate	0.43		
	27-49	0.06-0.6	0.06-0.11	4.5-5.5	<2	Low-----	Moderate	Moderate	0.43		
	49-60	---	---	---	---	---	---	---	---		
Linker: 15-----	0-5	0.6-2.0	0.11-0.17	3.6-5.5	<2	Low-----	Low-----	High-----	0.28	3	---
	5-33	0.6-2.0	0.11-0.20	3.6-5.5	<2	Low-----	Low-----	High-----	---		
	33-35	---	---	---	---	---	---	---	---		
Ouachita: 16-----	0-11	0.6-2.0	0.15-0.24	4.5-6.0	<2	Low-----	Low-----	Moderate	0.37	5	---
	11-72	0.2-0.6	0.15-0.24	4.5-5.5	<2	Low-----	Moderate	Moderate	0.32		
117: Ouachita part---	0-11	0.6-2.0	0.15-0.24	4.5-6.0	<2	Low-----	Low-----	Moderate	0.37	5	---
	11-72	0.2-0.6	0.15-0.24	4.5-5.5	<2	Low-----	Moderate	Moderate	0.32		
Amy part-----	0-45	0.6-2.0	0.13-0.24	4.5-5.5	<2	Low-----	High-----	Moderate	0.43	5	---
	45-72	0.06-0.2	0.16-0.24	4.5-5.5	<2	Low-----	High-----	Moderate	0.43		
Saffell: 18-----	0-9	2.0-6.0	0.05-0.10	4.5-5.5	<2	Low-----	Low-----	Moderate	0.20	4	---
	9-36	0.6-2.0	0.06-0.12	4.5-5.5	<2	Low-----	Low-----	Moderate	0.28		
	36-76	0.6-6.0	0.04-0.11	4.5-5.5	<2	Low-----	Low-----	Moderate	0.17		
119: Saffell part---	0-9	2.0-6.0	0.05-0.10	4.5-5.5	<2	Low-----	Low-----	Moderate	0.20	4	---
	9-36	0.6-2.0	0.06-0.12	4.5-5.5	<2	Low-----	Low-----	Moderate	0.28		
	36-76	0.6-6.0	0.04-0.11	4.5-5.5	<2	Low-----	Low-----	Moderate	0.17		
Urban land part.											
Savannah: 20, 22-----	0-14	0.6-2.0	0.10-0.15	4.0-5.5	<2	Low-----	Moderate	High-----	0.24	3	---
	14-32	0.6-2.0	0.13-0.20	4.0-5.5	<2	Low-----	Moderate	High-----	0.28		
	32-72	0.2-0.6	0.05-0.10	4.0-5.5	<2	Low-----	Moderate	High-----	0.24		
121: Savannah part---	0-14	0.6-2.0	0.10-0.15	4.0-5.5	<2	Low-----	Moderate	High-----	0.24	3	---
	14-32	0.6-2.0	0.13-0.20	4.0-5.5	<2	Low-----	Moderate	High-----	0.28		
	32-72	0.2-0.6	0.05-0.10	4.0-5.5	<2	Low-----	Moderate	High-----	0.24		
Urban land part.											
123: Savannah part---	0-14	0.6-2.0	0.10-0.15	4.0-5.5	<2	Low-----	Moderate	High-----	0.24	3	---
	14-32	0.6-2.0	0.13-0.20	4.0-5.5	<2	Low-----	Moderate	High-----	0.28		
	32-72	0.2-0.6	0.05-0.10	4.0-5.5	<2	Low-----	Moderate	High-----	0.24		
Urban land part.											
Sherwood: 124: Sherwood part---	0-16	2.0-6.0	0.10-0.18	4.5-6.0	<2	Low-----	Low-----	Moderate	0.37	3	---
	16-40	0.6-2.0	0.11-0.18	4.5-5.5	<2	Low-----	Moderate	Moderate	0.32		
	40-61	---	---	---	---	---	---	---	---		
Rock outcrop part.											

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Risk of corrosion		Erosion factors		Wind erodibility group
							Uncoated steel	Concrete	K	T	
	In	In/hr	In/in	pH	Mmhos/cm						
Smithdale:											
25, 27-----	0-15	2.0-6.0	0.05-0.10	4.5-5.5	<2	Low-----	Low-----	Moderate	0.17	5	---
	15-26	0.6-2.0	0.15-0.17	4.5-5.5	<2	Low-----	Low-----	Moderate	0.24		
	26-99	2.0-6.0	0.14-0.16	4.5-5.5	<2	Low-----	Low-----	Moderate	0.28		
126:											
Smithdale part--	0-15	2.0-6.0	0.05-0.10	4.5-5.5	<2	Low-----	Low-----	Moderate	0.17	5	---
	15-26	0.6-2.0	0.15-0.17	4.5-5.5	<2	Low-----	Low-----	Moderate	0.24		
	26-80	2.0-6.0	0.14-0.16	4.5-5.5	<2	Low-----	Low-----	Moderate	0.28		
Urban land part.											
128:											
Smithdale part--	0-15	2.0-6.0	0.05-0.10	4.5-5.5	<2	Low-----	Low-----	Moderate	0.17	5	---
	15-26	0.6-2.0	0.15-0.17	4.5-5.5	<2	Low-----	Low-----	Moderate	0.24		
	26-80	2.0-6.0	0.14-0.16	4.5-5.5	<2	Low-----	Low-----	Moderate	0.28		
Darco part-----	0-45	6.0-20	0.07-0.11	4.5-6.5	<2	Low-----	Low-----	Moderate	0.17	5	---
	45-80	0.6-2.0	0.11-0.16	4.5-6.5	<2	Low-----	Moderate	High-----	0.24		
Tiak:											
29, 31-----	0-12	0.6-2.0	0.11-0.20	4.5-6.0	<2	Low-----	Low-----	High-----	0.37	4	---
	12-32	0.06-0.2	0.11-0.20	4.5-5.5	<2	High-----	High-----	High-----	0.37		
	32-72	0.06-0.2	0.11-0.18	4.5-5.5	<2	High-----	High-----	High-----	0.37		
130:											
Tiak part-----	0-12	0.6-2.0	0.11-0.20	4.5-6.0	<2	Low-----	Low-----	High-----	0.37	4	---
	12-32	0.06-0.2	0.11-0.20	4.5-5.5	<2	High-----	High-----	High-----	0.37		
	32-72	0.06-0.2	0.11-0.18	4.5-5.5	<2	High-----	High-----	High-----	0.37		
Urban land part.											
Udorthents:											
32-----	0-6	0.6-2.0	0.12-0.24	4.5-6.5	<2	Low-----	Moderate	High-----	0.24	4	---
	6-36	2.0-6.0	0.04-0.12	4.5-5.5	<2	Low-----	Moderate	High-----	0.20		
	36-61	0.6-2.0	0.06-0.15	3.6-5.5	<2	Low-----	High-----	High-----	0.24		
Wrightsville:											
33-----	0-30	0.2-0.6	0.16-0.24	3.6-5.5	<2	Low-----	High-----	High-----	0.49	5	---
	30-50	<0.06	0.14-0.22	3.6-5.5	<2	High-----	High-----	High-----	0.37		
	50-72	<0.06	0.14-0.22	3.6-8.4	<2	High-----	High-----	High-----	0.43		
Zafra:											
134:											
Zafra part-----	0-8	0.6-2.0	0.10-0.19	5.1-6.0	<2	Low-----	Low-----	Moderate	0.37	3	---
	8-40	0.6-2.0	0.10-0.15	4.5-5.0	<2	Low-----	Moderate	High-----	0.32		
	40-42	---	---	---	---	---	---	---	---		
Leadvale part---	0-5	0.6-2.0	0.17-0.22	4.5-5.5	<2	Low-----	Moderate	Moderate	0.43	3	---
	5-27	0.6-2.0	0.17-0.20	4.5-5.5	<2	Low-----	Moderate	Moderate	0.43		
	27-49	0.06-0.6	0.06-0.11	4.5-5.5	<2	Low-----	Moderate	Moderate	0.43		
	49-60	---	---	---	---	---	---	---	---		

¹This map unit is made up of two or more dominant kinds of soil. See map unit description for the composition and behavior of the whole map unit.

TABLE 17.--SOIL AND WATER FEATURES

[Absence of an entry indicates the feature is not a concern. See text for descriptions of symbols and such terms as "rare," "brief," and "perched." The symbol < means less than; > means greater than]

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Cemented pan	
		Frequency	Duration	Months	Depth Ft	Kind	Months	Depth In	Hard-ness	Depth In	Hard-ness
Allen: 1-----	B	None-----	---	---	>6.0	---	---	>60	---	---	---
Amy: 2, 3, 14-----	C	None to common.	Brief to very long.	Dec-May	0-1.0	Perched	Dec-Apr	>60	---	---	---
Angie: 5-----	C	None-----	---	---	3.0-5.0	Apparent	Dec-Mar	>60	---	---	---
Avilla: 6, 7-----	B	None-----	---	---	>6.0	---	---	>60	---	---	---
Caddo Variant: 18:											
Caddo part----	D	None-----	---	---	0-2.0	Apparent	Dec-Apr	>60	---	---	---
Messer part----	C	None-----	---	---	1.5-3.0	Apparent	Dec-Apr	>60	---	---	---
Carnasaw: 19:											
Carnasaw part--	C	None-----	---	---	>6.0	---	---	30-60	Rip-pable	---	---
Townley part---	C	None-----	---	---	>6.0	---	---	20-40	Rip-pable	---	---
110:											
Carnasaw part--	C	None-----	---	---	>6.0	---	---	30-60	Rip-pable	---	---
Townley part---	C	None-----	---	---	>6.0	---	---	20-40	Rip-pable	---	---
111:											
Carnasaw part--	C	None-----	---	---	>6.0	---	---	30-60	Rip-pable	---	---
Pirum part----	B	None-----	---	---	>6.0	---	---	22-50	Hard	---	---
Townley part---	C	None-----	---	---	>6.0	---	---	20-40	Rip-pable	---	---
112:											
Carnasaw part--	C	None-----	---	---	>6.0	---	---	20-60	Rip-pable	---	---

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Cemented pan	
		Frequency	Duration	Months	Depth Ft	Kind	Months	Depth In	Hardness	Depth In	Hardness
Ouachita: 16-----	C	Common-----	Long to very long.	Dec-May	>6.0	---	---	>60	---	---	---
¹¹⁷ : Ouachita part--	C	Common-----	Long to very long.	Dec-May	>6.0	---	---	>60	---	---	---
any part-----	D	None to	Brief to	Dec-May	0-1.0	Perched	Dec-Apr	>60	---	---	---
Saffell: 18-----	B	common.	very long.	---	>6.0	---	---	>60	---	---	---
¹¹⁹ : Saffell part--	B	None-----	---	---	>6.0	---	---	>60	---	---	---
Urban land part.											
Savannah: 20, 22-----	C	None-----	---	---	1.5-3.0	Perched	Jan-Mar	>60	---	---	---
¹²¹ : Savannah part--	C	None-----	---	---	1.5-3.0	Perched	Jan-Mar	>60	---	---	---
Urban land part.											
¹²³ : Savannah part--	C	None-----	---	---	1.5-3.0	Perched	Jan-Mar	>60	---	---	---
Urban land part.											
Sherwood: ¹²⁴ : Sherwood part--	B	None-----	---	---	>6.0	---	---	30-60	Rip-pable	---	---
Rock outcrop part.											
Smithdale: 25, 27-----	B	None-----	---	---	>6.0	---	---	>60	---	---	---
¹²⁶ : Smithdale part--	B	None-----	---	---	>6.0	---	---	>60	---	---	---
Urban land part.											
¹²⁸ : Smithdale part--	B	None-----	---	---	>6.0	---	---	>60	---	---	---
Darco part-----	A	None-----	---	---	>6.0	---	---	>60	---	---	---
Tiak: 29, 31-----	C	None-----	---	---	1.0-2.0	Perched	Nov-Mar	>60	---	---	---

SOIL SURVEY

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Cemented pan	
		Frequency	Duration	Months	Depth <u>Ft</u>	Kind	Months	Depth <u>In</u>	Hard-ness	Depth <u>In</u>	Hard-ness
Tiak: Urban land part.											
Udorthents: 32-----	B	None-----	---	---	>6.0	---	---	>60	---	---	---
Wrightsville: 33-----	D	None-----	---	---	0.6-1.5	Perched	Dec-Apr	>60	---	---	---
Zafra: ¹³⁴ Zafra part-----	B	None-----	---	---	>6.0	---	---	25-60	Hard	---	---
Leadvale part--	C	None-----	---	---	2.0-3.0	Perched	Jan-Apr	>48	Rip-pable	---	---

¹This map unit is made up of two or more dominant kinds of soil. See map unit description for the composition and behavior of the whole map unit.

TABLE 18.--PHYSICAL ANALYSES OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Particle-size distribution (percent less than 2.0 mm)					
			Very coarse sand through medium sand (2.0-0.25 mm)	Fine sand (0.25)-0.10 mm)	Very fine sand (0.10-0.05 mm)	Total sand (2.0-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)
	<u>In</u>							
Smithdale loamy sand: S-74-AR-125-1-(1-9)	0-6	Ap	28	46	4	78	17	5
	6-15	B1	22	46	4	72	22	6
	15-26	B21t	15	37	4	56	19	25
	26-37	B22t	16	51	6	73	15	12
	37-49	B23t	19	57	3	79	11	10
	49-61	B24t	16	59	3	78	10	12
	61-72	B24t	15	64	3	82	5	13
Tiak silt loam: S-74-AR-125-5-(1-7)	0-7	Ap	7	3	30	40	54	6
	7-12	A2	7	4	36	47	45	8
	12-22	B21t	4	2	22	28	31	41
	22-32	B22t	2	1	28	31	20	49
	32-43	B23t	2	2	26	30	22	48
	43-53	B23t	1	2	28	31	25	44
	53-64	B24t	1	1	6	8	35	57
	64-72	B3	2	32	22	56	14	30

SOIL SURVEY

TABLE 19.--CHEMICAL ANALYSES OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Extractable bases				Extractable acidity	Base saturation	Reaction (1:1 soil) water	Organic matter	Available phosphorus
			Ca	Mg	Na	K					
			Meq/100 g	Meq/100 g	Meq/100 g	Meq/100 g					
	<u>In</u>						<u>Pct</u>	<u>pH</u>	<u>Pct</u>	<u>P/m</u>	
Smithdale loamy sand: S74-AR-125-1-(1-9)	0-6	Ap	1.1	0.3	0.1	0.1	9.8	14	5.7	0.9	5
	6-15	B1	0.9	0.2	0.2	0.1	7.7	15	5.8	0.2	3
	15-26	B21t	1.8	1.4	0.2	0.2	9.7	27	5.3	0.4	5
	26-37	B22t	0.8	0.7	0.2	0.1	5.9	23	5.3	0.1	4
	37-49	B23t	0.7	0.7	0.2	0.1	4.6	27	5.2	0.1	4
	49-61	B24t	0.4	0.6	0.2	0.1	5.1	20	5.2	0.1	3
	61-72	B24t	0.4	0.5	0.2	0.1	5.0	19	5.2	0.1	4
Tiak silt loam: S-74-AR-125-5-(1-7)	0-7	Ap	1.2	0.5	0.2	0.1	7.4	21	4.7	2.4	10
	7-12	A2	1.0	0.4	0.2	0.1	5.1	25	5.0	1.1	7
	12-22	B21t	0.3	1.4	0.2	0.2	22.3	9	4.8	0.6	4
	22-32	B22t	0.3	2.6	0.3	0.2	24.4	12	4.6	0.3	1
	32-43	B23t	0.3	2.0	0.3	0.2	24.7	10	4.7	0.3	2
	43-53	B23t	0.3	1.8	0.4	0.2	28.0	9	4.8	0.2	2
	53-64	B24t	0.3	3.2	0.7	0.3	39.5	10	4.7	0.1	2
	64-72	B3	0.3	1.4	0.5	0.2	17.3	12	4.9	0.2	2

TABLE 20.--ENGINEERING TEST DATA

[Tests performed by Arkansas State Highway Department, in cooperation with the Bureau of Public Roads, U.S. Department of Commerce, in accordance with standard procedures of the American Association of State Highway and Transportation Officials (AASHTO) ¹]

Soil name and location	Arkansas State Highway Laboratory Nos	Depth from surface	Moisture-density ¹		Percentage passing sieve-- ²			Liquid limit	Plasticity index	Classification	
			Optimum moisture	Maximum dry density	No. 10	No. 40	No. 200			AASHTO ³	Unified ⁴
		In		Pct				Pct			
Carnasaw gravelly silt loam: NW1/4NW1/4NE1/4 sec. 5, T. 1 S., R. 17 W.	2-4	6-21	87	33	99	96	94	67	30	A-7-5(36)	MH
	2-5	21-29	91	29	98	93	90	63	29	A-7-5(33)	MH
	2-6	29-40	89	27	100	98	94	59	24	A-7-5(28)	MH
Tiak silt loam: NW1/4SW1/4NE1/4 sec. 33, T. 2 S., R. 12 W.	5-4	22-32	95	22	100	99	91	67	43	A-7-6(44)	CH
	5-5	32-53	98	24	100	99	89	58	34	A-7-6(34)	CH
	5-6	53-64	92	27	100	99	90	57	29	A-7-6(30)	CH

¹Based on AASHTO Designation: T 99-57, Method A (1)

²Mechanical analysis according to AASHTO Designation T 88-57 (1). Results by this procedure may differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHTO procedure, the fine material is analyzed by the hydrometer method and the various grain-sized fractions

are calculated on the basis of all material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-sized fractions. The mechanical analysis data used in this table are not suitable for naming textural classes for soils.

TABLE 21.--CLASSIFICATION OF THE SOILS

[An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics of this taxadjunct that are outside the range of the series]

Soil name	Family or higher taxonomic class
Allen-----	Fine-loamy, siliceous, thermic Typic Paleudults
Amy-----	Fine-silty, siliceous, thermic Typic Ochraquults
Angie-----	Clayey, mixed, thermic Aquic Paleudults
Avilla-----	Fine-loamy, siliceous, thermic Typic Paleudults
Caddo Variant-----	Fine-silty, siliceous, thermic Typic Glossaqualfs
Carnasaw-----	Clayey, mixed, thermic Typic Hapludults
Darco-----	Loamy, siliceous, thermic Grossarenic Paleudults
Leadvale-----	Fine-silty, siliceous, thermic Typic Fragiudults
Linker-----	Fine-loamy, siliceous, thermic Typic Hapludults
Messer Variant-----	Coarse-silty, siliceous, thermic Typic Hapludalfs
Ouachita-----	Fine-silty, siliceous, thermic Fluventic Dystrochrepts
Pirum-----	Fine-loamy, siliceous, thermic Typic Hapludults
Saffell-----	Loamy-skeletal, siliceous, thermic Typic Hapludults
Savannah-----	Fine-loamy, siliceous, thermic Typic Fragiudults
*Sherwood-----	Fine-loamy, mixed, thermic Typic Hapludults
Smithdale-----	Fine-loamy, siliceous, thermic Typic Paleudults
Tiak-----	Clayey, mixed, thermic Aquic Paleudults
Townley-----	Clayey, mixed, thermic Typic Hapludults
Udorthents-----	Udorthents
Wrightsville-----	Fine, mixed, thermic Typic Glossaqualfs
Zafra-----	Loamy-skeletal, siliceous, thermic Typic Hapludults

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