United States Department of Agriculture

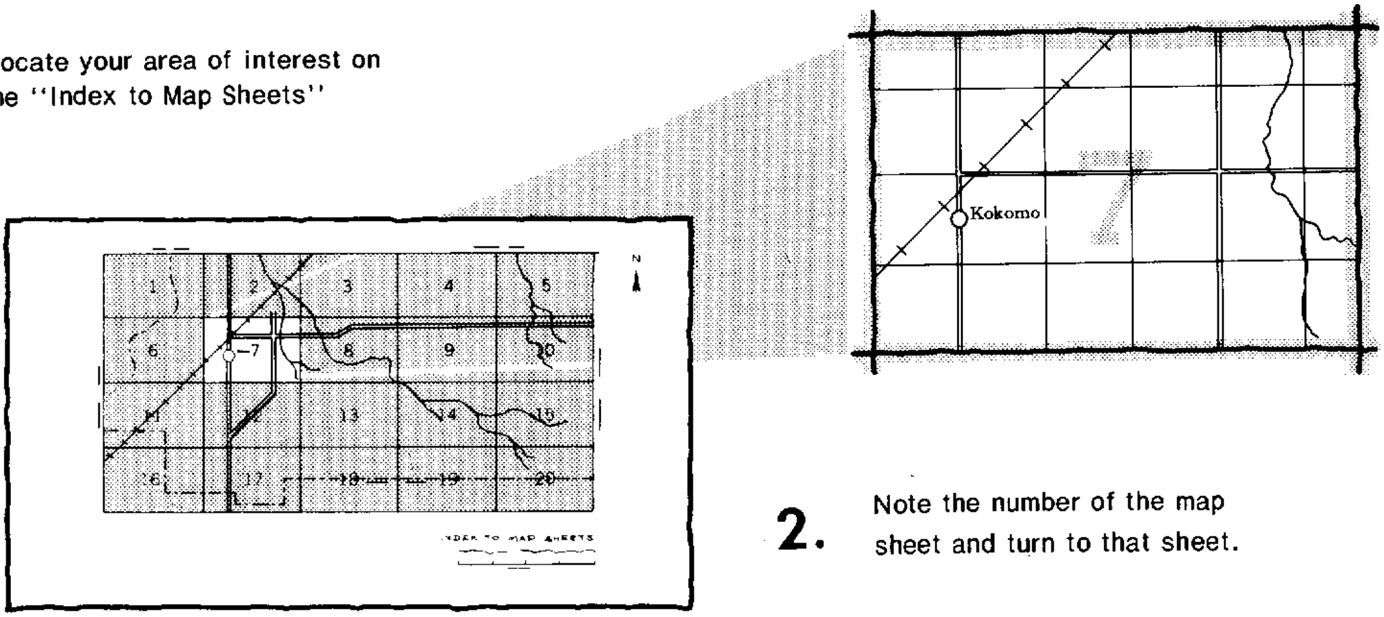
Soil Conservation Service

In cooperation with the Louisiana Agricultural Experiment Station and the Louisiana Soil and Water Conservation Committee

Soil Survey of Morehouse Parish Louisiana

HOW TO USE

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



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

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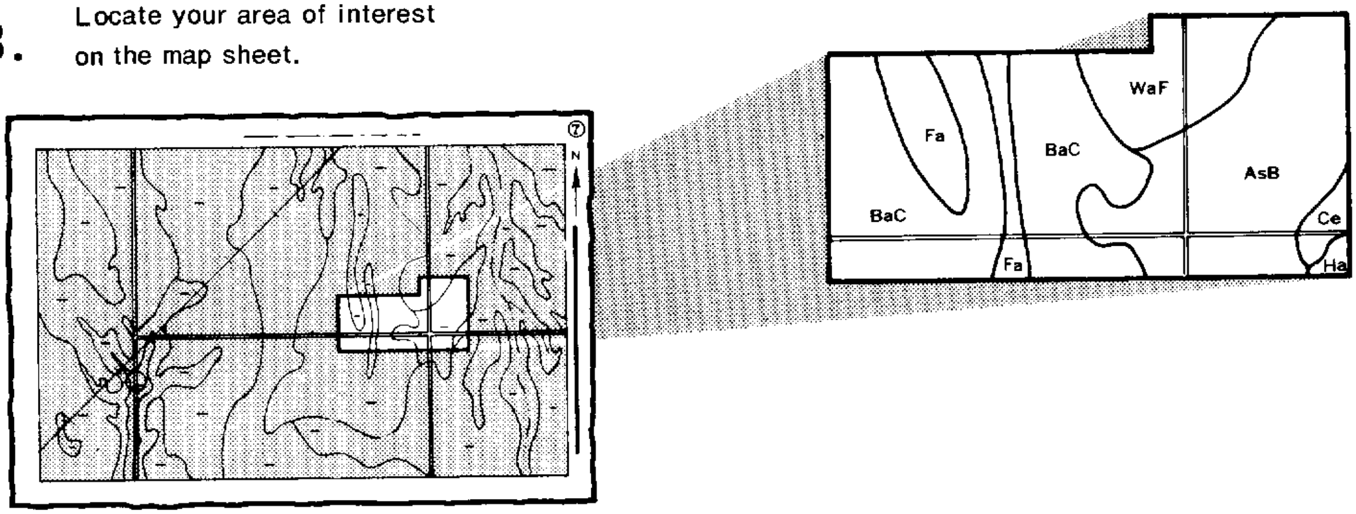

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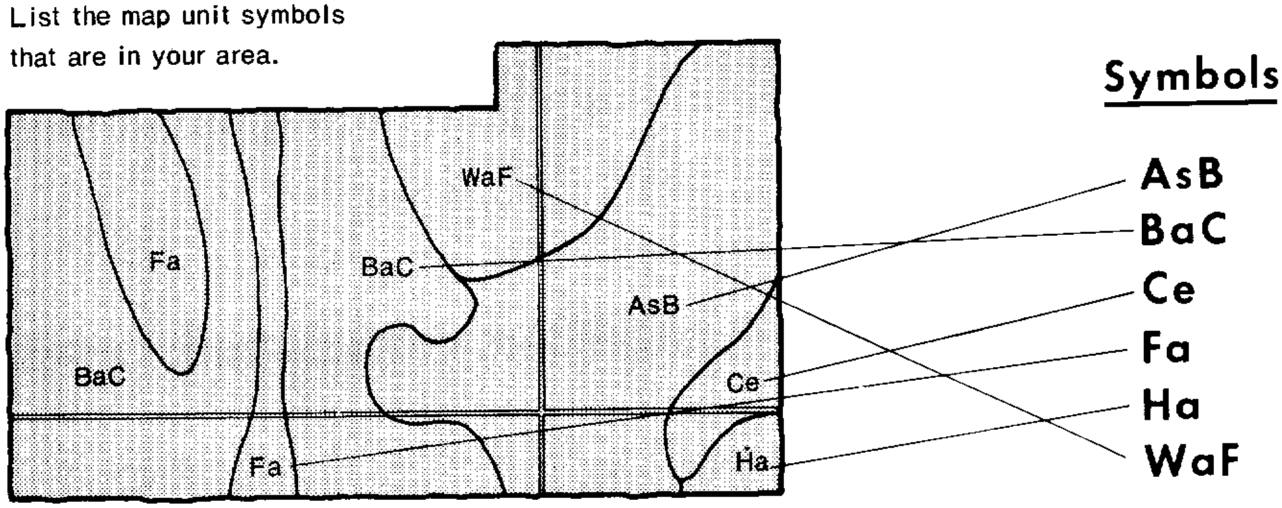
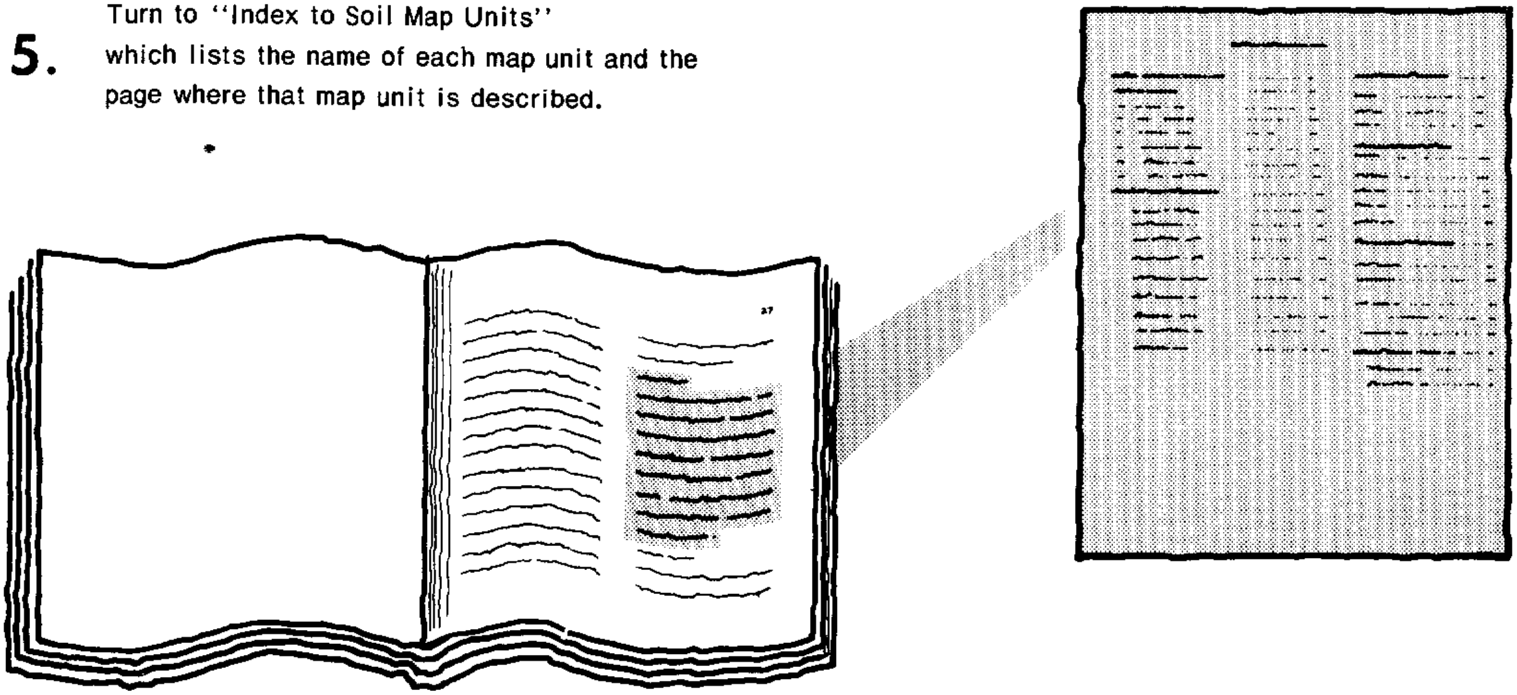
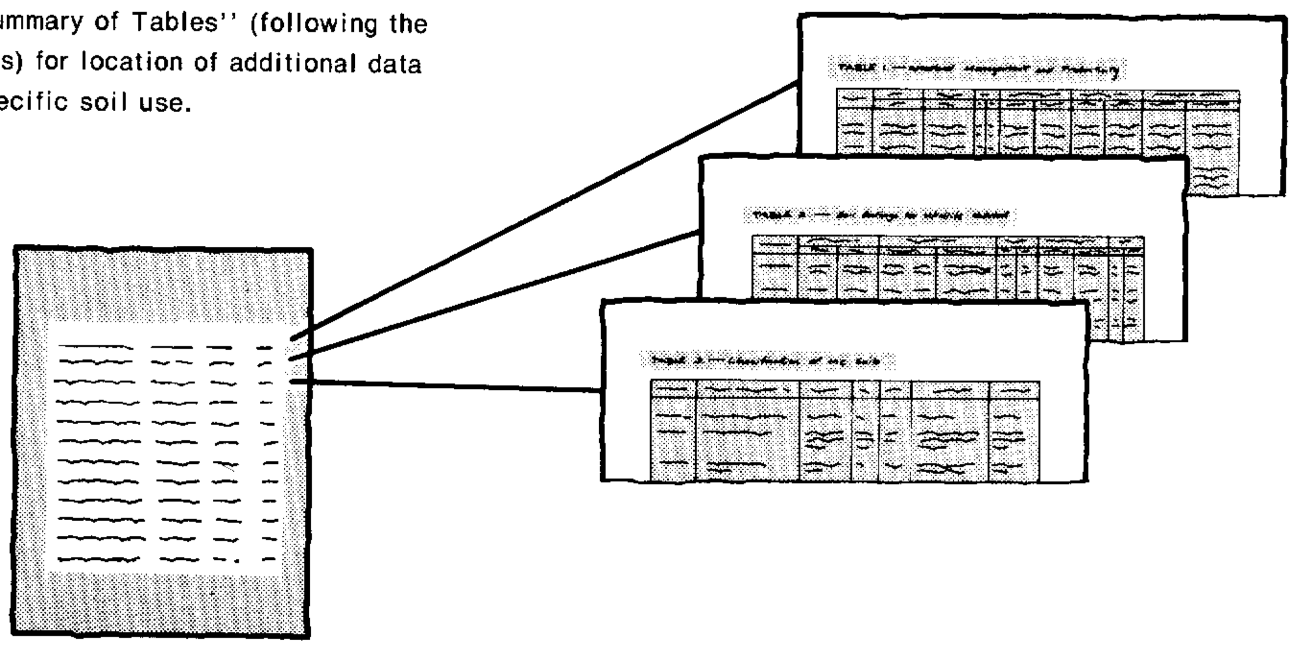


THIS SOIL SURVEY

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



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



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

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Foreword

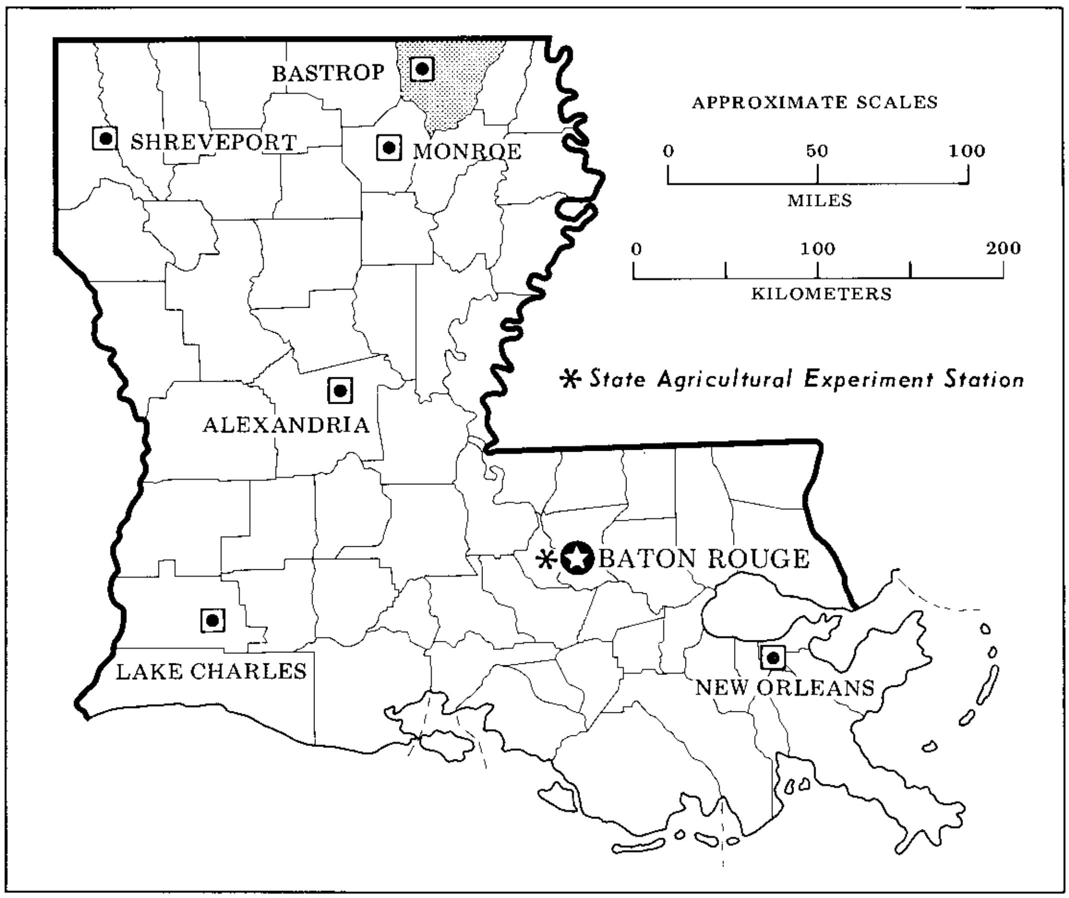
This soil survey contains information that can be used in land-planning programs in Morehouse Parish. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact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

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

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

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

Harry S. Rucker
State Conservationist
Soil Conservation Service



Location of Morehouse Parish in Louisiana.

Soil Survey of
Morehouse Parish, Louisiana

By Emmett F. Reynolds, E. Thurman Allen, Teresa L. May, and
Tracey A. Weems, Soil Conservation Service

United States Department of Agriculture,
Soil Conservation Service
in cooperation with the
Louisiana Agricultural Experiment Station and the
Louisiana Soil and Water Conservation Committee

Morehouse Parish is in northeastern Louisiana, about 20 miles northeast of Monroe. The total area is 517,379 acres, of which 505,323 acres is land and 12,056 acres is water in the form of lakes, reservoirs, streams, and other waterways. Morehouse Parish is bordered on the north by Arkansas. The Ouachita River forms the western boundary of the parish, the Boeuf River forms the eastern boundary, and Bayou LaFourche forms the southern boundary. In 1980, the population of the parish was 33,760, according to the Bureau of the Census. Bastrop, with a population of 15,401, is the largest city and the parish seat. The parish is mostly rural, except for the urban and industrial area around Bastrop.

The parish consists of three major physiographic areas. They are the level to gently undulating flood plains, the level to moderately sloping terrace uplands, and the level, low stream terraces. The elevation ranges from about 170 feet above sea level on the terrace uplands southeast of Bastrop to about 50 feet in the backswamps of the Ouachita River in the northwestern part of the parish.

The flood plains make up most of the eastern half of the parish and also extend from north to south along the western edge. They make up nearly three-fourths of the parish. The soils on these flood plains range from loamy to clayey and from well drained to very poorly drained. Most of the acreage is in cultivated crops such as rice. A small acreage is used for homesites, pasture, orchards, and woodland. The loamy soils are on the higher, natural levees of rivers and bayous. These soils are fertile and have few limitations for crops. The clayey soils, which are in the lower areas, are limited by wetness. Some of these clayey soils are flooded by runoff and stream overflow, and drainage is needed for most crops.

The terrace uplands extend from north to south through the central part of the parish and make up about one-fifth of the parish. The soils on these uplands are mainly loamy. They are generally low in natural fertility. Most of the acreage is woodland. A small acreage is used for homesites, pasture, and cultivated crops. Wetness is the main limitation for woodland. Slope and low fertility are additional limitations for crops and pasture. The hazard of erosion is slight to severe.

The low stream terraces make up the remainder of the parish and extend from north to south along the edge of the alluvial plains of the Ouachita River in the western part of the parish. The soils on these terraces are mainly loamy, but some have a clayey subsoil. They are low in natural fertility. Most of the acreage is woodland. A small acreage is in cultivated crops and pasture. Wetness is the main limitation for most uses.

General Nature of the Parish

This section gives general information about the parish. It describes the history and development, agriculture, water resources, climate, transportation, and industry.

History and Development

Morehouse Parish was created from Ouachita Parish by the Legislature of Louisiana in 1844. It was named after Abram Morehouse, who came from Kentucky in 1806 to assist Baron de Bastrop in colonizing the area.

The Baron had been given a large grant of land by the Spanish Crown, which included the present Morehouse Parish. He appointed Morehouse to help settle the country.

The first colony in the parish was about 1-1/2 miles west of the present town of Mer Rouge. It was named Prairie Mer Rouge. The second settlement of any size was at Port Jefferson, known today as Oak Ridge. The city of Bastrop was named after Baron de Bastrop and is just east of the old port site of Point Pleasant on Bayou Bartholomew. Other communities in the parish include Beekman, Bonita, Collingston, Galion, Log Cabin, Jones, and Twin Oaks.

Agriculture

Agriculture has been the dominant land use in Morehouse Parish since about 1797 when Baron de Bastrop placed the following notice in a Kentucky newspaper: "I will give to every family, industrious and well recommended, 400 acres of land—take where you please...." This offer brought settlers who began steadily clearing this wild country and farming the rich alluvial bottomland soils. Today nearly all of the nonflooded bottomland soils are farmed. The terrace uplands and low stream terraces have, for the most part, been replanted to pine forest. A small acreage is in row crops and pasture.

Morehouse Parish has recently experienced a decrease in the number of farms and an increase in the average size of farms, according to the 1974 Census of Agriculture. In 1969 there were 726 farms and in 1974 there were 511. The average size increased from 370 acres in 1969 to 549 acres in 1974. The total amount of farmland increased from 268,400 acres in 1969 to 280,722 acres in 1974. The total amount of cropland increased from 207,149 acres in 1969 to 227,430 acres in 1980.

According to the Morehouse Parish office of the Agricultural Stabilization and Conservation Service, in 1980 about 95,151 acres of cotton, 50,120 acres of rice, and 72,303 acres of soybeans were planted. Smaller acreages of wheat, peanuts, and corn were also planted that year. Table 1 shows the major crops; acres planted in 1980, 1977, and 1974; and total yields and yields per acre in 1974.

In 1974, about 255 farms maintained 22,050 cattle and calves on 40,536 acres of pasture and woodland pasture.

The present trend in Morehouse Parish appears to be an increase in the acreage planted to soybeans. If present trends continue, acreage used for woodland will decrease in the next 20 years as acreage used for cropland increases.

Water Resources

Charles R. Akers, geologist, Soil Conservation Service, helped prepare this section.

Morehouse Parish has supplies of both surface water and ground water. The principal sources of surface water in Morehouse Parish are Bayou Bartholomew, Boeuf River, Bayou Bonne Idee, and Bussy Brake Lake. In 1975, about 62 million gallons per day were removed from these sources (*45*).

According to the Louisiana Stream Control Commission, the quality of the water in the Ouachita River, Bayou Bartholomew, Boeuf River, and Bayou Bonne Idee meets the criteria for recreational uses and for the propagation of fish and wildlife. The Ouachita River and Bayou Bartholomew also are suitable sources for domestic raw water (*18*).

The major ground water aquifers in Morehouse Parish are those in the formations of Pleistocene age and the Cockfield, Cook Mountain, and Sparta Formations of Eocene age. In 1975, about 110 million gallons per day were removed from these aquifers in Morehouse Parish (*18*).

Heavy industrial pumping near Bastrop has lowered the pumping level of wells in the formations of Pleistocene age from approximately 67 feet mean sea level in 1945 to approximately 46 feet mean sea level in 1970 (*44*).

In general, the Pleistocene aquifers are recharged by rainfall infiltration and seepage from streams that cut the Pleistocene age sand above the water table. However, the Boeuf River cuts the Pleistocene age sand below the water table and the aquifer discharges into the river except for short periods when the river is high (*44*).

Although the ground water in the Pleistocene aquifers is mainly of the calcium-magnesium bicarbonate type its quality varies between different topographic positions and parts of the parish. Water from wells in the valley generally contains excessive iron and is very hard; water from wells in the upland areas is low in content of iron, slightly corrosive, and moderately hard. Water from Pleistocene aquifers in the northern part of the parish is of poorer quality than elsewhere. It not only is harder but also contains as much as 680 milligrams of chloride per liter. Some of the Pleistocene water in this area has a high to very high salinity hazard and a low to medium sodium hazard for use as irrigation water (*44*).

The Cockfield Formation ranges in thickness from a few feet in the western part of the parish to about 300 feet in the northeastern part (*44*). The sands that create the aquifer are not connected, and are usually located in the lower part of the formation. In places the Cockfield aquifer is hydraulically connected to an overlying Pleistocene aquifer and the underlying Cook Mountain aquifer. The elevation of the surface of the water in the Cockfield aquifer ranges from about 65 to 95 feet mean sea level. Water from the Cockfield aquifer is used as municipal supply in the towns of Bonita and Oak Ridge and as domestic water on some farmsteads. Most of the water is of the calcium-magnesium bicarbonate type. The yields are generally too low for rice irrigation. In the eastern two-thirds of the parish, however, at least one well yielding 250 to 500 gallons per minute can be developed for every 12 to 15 square miles (*44*).

Water from the Cook Mountain aquifer is generally suitable for domestic use, but the chloride content exceeds 250 milligrams per liter in the eastern half of the parish (*44*).

The Sparta Formation ranges in thickness from 600 feet in the western part of Morehouse Parish to 700 feet in the northeastern part. This formation consists mainly of interconnected sand beds, some of which are more than 200 feet thick (*44*). Both public and industrial waters are obtained from the Sparta aquifer at Bastrop. Heavy pumping in this area has created a massive cone (*44*).

The Sparta aquifer contains fresh water only in the western half of Morehouse Parish. The Sparta water in the eastern half of the parish contains over 250 milligrams of chloride per liter (*44*). Fresh water from this aquifer is a soft, sodium bicarbonate type. Yields from wells completed in the Sparta Formation are as high as 1,500 gallons per minute.

Climate

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

Morehouse Parish has long, hot summers because moist tropical air from the Gulf of Mexico persistently covers the area. Winters are cool and fairly short. Cold waves are rare and moderate in one or two days. Precipitation is fairly heavy throughout the year, and prolonged droughts are rare.

Table 2 gives data on temperature and precipitation for the survey area as recorded at Bastrop in the period 1951 to 1973. Table 3 shows probable dates of the first freeze in fall and the last freeze in spring. Table 4 provides data on length of the growing season.

In winter the average temperature is 49° F, and the average daily minimum temperature is 38°. The lowest temperature on record, which occurred at Bastrop on January 12, 1962, is 4°. In summer the average temperature is 82°, and the average daily maximum temperature is 93°. The highest recorded temperature, which occurred at Bastrop on September 5, 1951, is 110°.

Growing degree days are shown in table 2. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50° F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 50.37 inches. Of this, 23.90 inches, or 50 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 10.26 inches. The heaviest 1-day rainfall during the period of record was 6 inches at Bastrop on May 1, 1954. Thunderstorms occur on about 60 days each year, and most occur in summer.

Snowfall is rare. In 60 percent of the winters, there is no measurable snowfall. In 15 percent, the snowfall, usually of short duration, is more than 2 inches. The heaviest 1-day snowfall on record was more than 5 inches.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The sun shines 70 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 10 miles per hour, in spring.

Transportation

Morehouse Parish is served by two major railroads that connect to every major railroad system in the country. There is one United States highway and numerous other paved state and parish roads.

The parish is served by one airport that charters air service. There are several private airstrips as well as commercial crop dusting service strips scattered throughout the parish. Commercial air service is available in Monroe, which is less than 25 miles from Bastrop. One major bus line serves the parish.

Industry

Industrial development began in Morehouse Parish in the 1890's with the coming of railroads. At that time several large sawmills were established, and they began cutting virgin pine, oak, and cypress timber. In 1916 the first natural gas well of the Monroe Gas Field was discovered in Morehouse Parish. This field was soon to become the largest natural gas field in the world at that time. This field is still in production and supplies most of the natural gas used locally.

Another important industry was the Bastrop Pulp and Paper Company, which located in the parish in 1920. Today two paper mills are located in Bastrop. Other industries include plants manufacturing paper-related materials, chemicals, garments, furniture, farm machinery, trailers, logging equipment, refraction and tile tanks, and concrete products.

How This Survey Was Made

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

The soils in the survey area occur in an orderly pattern that is related to the geology, the landforms, relief, climate, and the natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with considerable accuracy the kind of soil at a specific location on the landscape.

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

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, acidity, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangements of horizons within the profile. After the soil scientists classified and named the soils in the survey area they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses. Soil scientists interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties in terms of expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and new interpretations sometimes are developed to meet local needs. Data were assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management were assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can state with a fairly high degree of probability that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

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

Map Unit Composition

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

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

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

Descriptions, names, and delineations of soils in this survey do not fully agree with those in published surveys of adjacent parishes in Louisiana or counties in Arkansas. These differences are the result of better information on soils, modifications in series concepts, intensity of mapping, or the extent of soils within the survey area.

General Soil Map Units

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

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

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

The soils in the survey area vary widely in their suitability for major land uses. Table 5 shows the extent of the map units shown on the general soil map. It lists the suitability of each, in relation to that of the other map units, for major land uses and shows soil properties that limit use. Soil suitability ratings are based on the practices commonly used in the survey area to overcome soil limitations. These ratings reflect the ease of overcoming the limitations. They also reflect the problems that will persist even if such practices are used.

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

The boundaries of the general soil map units in Morehouse Parish were matched, where possible, with those of the previously published surveys of Ouachita Parish, La., and Ashley County, Ark. In a few places, however, the lines do not join, and the names of the map units differ. These differences resulted mainly because of changes in soil series concepts, differences in map unit design, and changes in soil patterns near the survey area boundaries. The boundaries of the general soil map units in Morehouse Parish do not match those of the previously published survey of West Carroll Parish, La., because the two parishes are separated by a wide, perennial stream.

Soil Descriptions

Areas dominated by level to gently undulating soils on flood plains

The eight map units in this group consist of loamy, clayey, and sandy soils on the flood plains of rivers, bayous, and small streams that drain the terrace uplands. Slopes range from 0 to 3 percent.

The eight units cover about 73.5 percent of the parish. Most of the acreage is in cultivated crops. Map units that are subject to occasional and frequent flooding are mainly in woodland. Wetness from the seasonal high water table and flooding is the main limitation for most agricultural and urban uses.

1. Hebert-Sterlington-Rilla

Somewhat poorly drained and well drained, level to gently undulating, loamy soils

This map unit consists of soils on broad flats and natural levees along the Boeuf River, Bayou Bonne Idee, and other former channels and distributaries of the Arkansas River. The landscape in most areas is one of long, smooth slopes of 0 to 1 percent. In other areas it is low, parallel ridges and swales that have slopes of 0 to 3 percent.

This unit covers about 27 percent of the parish. It is about 53 percent Hebert soils, 21 percent Sterlington soils, 18 percent Rilla soils, and 8 percent soils of minor extent.

Hebert soils are somewhat poorly drained and have a surface layer of brown silt loam and dark brown silty clay loam. The subsurface layer is light brownish gray, mottled silt loam. The subsoil is silt loam and silty clay loam. It is mottled, reddish gray and grayish brown in the upper part and mottled, reddish brown and brown in the lower part. The underlying material is mottled, reddish brown and brown silt loam and silty clay loam.

Sterlington soils are well drained and have a surface layer of brown, dark brown, and dark yellowish brown silt loam. The subsoil is mainly a brownish silt loam and very fine sandy loam. The underlying material is strong brown very fine sandy loam.

Rilla soils are well drained and have a surface layer of brown silt loam. The subsurface layer is pale brown silt loam. The subsoil is strong brown, reddish brown, and yellowish red silt loam and silty clay loam. The underlying material is yellowish red loam and reddish brown silt loam.

Of minor extent in this unit are the well drained Gallion soils, the somewhat poorly drained Portland soils, and the poorly drained Perry soils. The Gallion soils are in positions similar to those of the Rilla and Sterlington soils. The Perry and Portland soils are in backswamps on flood plains. Also of minor extent are Hebert and Perry soils, along Bayou Bartholomew, that are frequently flooded and the very poorly drained Yorktown soils in former stream channels.

The soils making up this unit are used mainly for cotton, soybeans, corn, wheat, and truck crops. In a few small areas they are used as woodland and pasture, and in a few others they are used for urban structures.

The soils are well suited to cultivated crops and pasture. Wetness in the Hebert soil and in the included Perry and Portland soils is the main limitation. The Sterlington and Rilla soils have few limitations. The soils are well suited to the production of hardwood trees even though wetness moderately limits the use of equipment in some areas. The soils have good potential for use as habitat for openland and woodland wildlife. The soils are moderately well suited to urban uses. The main limitations are wetness, moderate shrink-swell potential, low strength as it affects local roads and streets, and moderate and moderately slow permeability.

2. Gallion-Mer Rouge-Hebert

Well drained to somewhat poorly drained, level to gently undulating, loamy soils

This map unit consists of soils on natural levees and broad flats on the flood plains of the Boeuf River, Bayou Bonne Idee, and other former channels and distributaries of the old Arkansas River. The landscape in most areas is one of long, smooth slopes of 0 to 1 percent. In other areas it is low, parallel ridges and swales that have slopes of 0 to 2 percent.

This unit covers about 5 percent of the parish. It is about 65 percent Gallion soils, 24 percent Mer Rouge soils, 9 percent Hebert soils, and 2 percent soils of minor extent.

Gallion soils are well drained and level. They have a surface layer mainly of dark grayish brown and dark yellowish brown silt loam and silty clay loam. The subsoil is mainly a brownish and reddish silt loam and silty clay loam. The underlying material is brown silt loam and silty clay loam.

Mer Rouge soils are moderately well drained and level. They have a surface layer mainly of very dark grayish brown and very dark gray silt loam and silty clay loam. The subsoil, in the upper part, is very dark grayish brown, black, and very dark brown silt loam and silty clay loam. In the middle and lower part, the subsoil is mainly dark brown, brown, and yellowish brown silt loam and silty clay loam.

Hebert soils are somewhat poorly drained and level and gently undulating. They have a surface layer of brown silt loam and dark brown silty clay loam. The subsurface layer is light brownish gray, mottled silt loam. The subsoil is silt loam and silty clay loam. It is mottled, reddish gray and grayish brown in the upper part and mottled, reddish brown and brown in the lower part. The underlying material is mottled, reddish brown and brown silt loam and silty clay loam.

Of minor extent in this unit are the well drained Rilla and Sterlington soils, the somewhat poorly drained Portland soils, and the poorly drained Perry soils. The Rilla and Sterlington soils are in positions similar to those of the Gallion soils. The Perry and Portland soils are in backswamps on the flood plains.

The soils making up this unit are used mainly for cotton, soybeans, corn, wheat, and truck crops. In a few small areas, they are used as woodland, as pasture, and for urban structures.

The soils are well suited to cultivated crops and pasture. Wetness is the main limitation. The soils are well suited to the production of hardwood trees, although wetness moderately limits the use of equipment. The soils have good potential as habitat for openland and woodland wildlife. The soils are moderately well suited to urban uses. The main limitations are wetness, moderate shrink-swell potential, low strength as it affects local roads and streets, and moderate and moderately slow permeability.

3. Perry-Portland

Poorly drained and somewhat poorly drained, level to gently undulating, clayey and loamy soils

This map unit consists of soils in backswamps and on slight rises on the flood plains of the Ouachita River, Bayou Bonne Idee, and other former channels and distributaries of the old Arkansas River. The landscape in most areas is one of long, smooth slopes of 0 to 1 percent. In other areas it is low, parallel ridges and swales that have slopes of 0 to 3 percent. Manmade levees protect the soils from most floods, but flooding can occur during periods of unusually high rainfall.

This unit covers about 32 percent of the parish. It is about 67 percent Perry soils, 17 percent Portland soils, and 16 percent soils of minor extent.

Perry soils are poorly drained and level and gently undulating. They have a surface layer of gray and dark grayish brown clay. The subsoil is mottled, gray, grayish brown, and dark reddish brown clay. The underlying material is reddish brown, mottled clay.

Portland soils are somewhat poorly drained and level. They have a surface layer of dark brown silt loam or brown clay. The subsoil is brown and reddish brown, mottled clay. The underlying material is reddish brown clay and silty clay loam.

Of minor extent in this unit are the well drained Gallion, Rilla, and Sterlington soils; the moderately well drained Mer Rouge soils; and the somewhat poorly drained Hebert soils. These soils are on higher positions than the Perry and Portland soils. Also of minor extent are Yorktown soils in former stream channels and sloughs.

The soils making up this unit are used mainly for soybeans, rice, grain sorghum, and wheat. In a few small areas, they are in woodland and pasture.

The soils are moderately well suited to cultivated crops and well suited to pasture. Wetness and poor tilth are the main limitations. The soils are moderately well suited to woodland. They have high potential for the production of hardwood trees even though wetness severely limits the use of equipment and the seedling mortality rate is moderate. The soils have good potential as habitat for wetland and woodland wildlife and fair potential for openland wildlife. The soils are poorly suited to urban uses. The main limitations are wetness, flooding, low strength as it affects local roads and streets, very slow permeability, and high and very high shrink-swell potential.

4. Perry-Portland, Flooded

Poorly drained and somewhat poorly drained, level, occasionally flooded, clayey soils

This map unit consists of soils in backswamps and broad flats on the flood plains of the Ouachita River, Boeuf River, and other former channels and distributaries of the old Arkansas River. These soils are at low elevations and subject to occasional flooding by stream overflow. The landscape is one of long, smooth slopes of 0 to 1 percent.

This unit covers about 2.5 percent of the parish. It is about 67 percent Perry, flooded, soils; 17 percent Portland, flooded, soils; and 16 percent soils of minor extent.

Perry, flooded, soils are poorly drained and have a surface layer of dark grayish brown, mottled clay. The subsoil is a mottled, gray clay in the upper part and mottled, reddish brown clay in the lower part.

Portland, flooded, soils are somewhat poorly drained and have a surface layer of brown, mottled clay. The subsoil and underlying material are reddish brown, mottled clay.

Of minor extent in this unit are the poorly drained Litro soils in backswamps on the flood plain of the Ouachita River.

The soils making up this unit are used mainly for woodland. In a few small areas, they are used for pasture and for soybeans and grain sorghum.

The soils are well suited to production of hardwood trees. Wetness from a seasonal high water table and flooding, however, severely limit the use of equipment during some seasons of the year. The soils are moderately well suited to pasture and poorly suited to cultivated crops. Wetness from the flooding and the seasonal high water table and poor tilth are the main limitations. The soils have fair or good potential as habitat for openland, woodland, and wetland wildlife. The soils are poorly suited to urban uses. The main limitations are wetness, flooding, high and very high shrink-swell potential, very slow permeability, and low strength as it affects local roads and streets.

5. Forestdale-Idee-Goodwill

Poorly drained, somewhat poorly drained, and well drained, level and gently undulating, loamy soils

This map unit consists of soils on the flood plains of the Boeuf River, Bayou Bonne Idee, and other former channels and distributaries of the Arkansas River. The landscape in some areas is one of long, smooth slopes of 0 to 1 percent. In other areas it is low, parallel ridges and swales that have slopes of 0 to 3 percent.

This unit covers about 2.5 percent of the parish. It is about 47 percent Forestdale soils, 40 percent Idee soils, 11 percent Goodwill soils, and 2 percent soils of minor extent.

Forestdale soils are poorly drained and level. They have a surface layer of dark grayish brown silty clay loam. The subsoil is light gray, light grayish brown, and gray, mottled silty clay and silty clay loam.

Idee soils are somewhat poorly drained and gently undulating. They have a surface layer of dark grayish brown silt loam. The subsoil is mottled, grayish brown, yellowish brown, and dark brown silty clay loam and silt loam.

Goodwill soils are drained and gently undulating. They have a surface layer of brown silt loam. The subsoil is mottled, brown, yellowish brown, and dark yellowish brown silt loam, silty clay loam, and fine sandy loam.

Of minor extent in this unit are the well drained Dexter soils, the somewhat poorly drained Hebert soils, and the poorly drained Perry soils. The Dexter soils are on higher positions on adjacent stream terraces. The Hebert soils are on broad flats and backslopes of natural levees. The Perry soils are in backswamps.

The soils making up this unit are used mainly for soybeans, rice, grain sorghum, wheat, and cotton. In a few small areas, they are used as pasture and for urban structures.

The soils are moderately well suited to cultivated crops and well suited to pasture. Wetness, medium fertility, and poor tilth are the main limitations. The soils are well suited to woodland. They have a high potential for the production of hardwood trees, although wetness limits the use of equipment. The soils have good potential as habitat for openland and woodland wildlife. The soils are poorly suited to urban uses. The main limitations are wetness from a seasonal high water table, low strength as it affects local roads and streets, moderately slow and very slow permeability, and moderate and high shrink-swell potential.

6. Litro-Haggerty

Poorly drained and somewhat poorly drained, level, clayey and sandy soils

This map unit consists of soils in backswamps and on former beaches of relict lakes on the flood plain of the Ouachita River. Manmade levees protect the soils from most floods, but they can be flooded during periods of unusually high rainfall. In most areas slopes are long and smooth and range from 0 to 2 percent.

This unit covers about 1.5 percent of the parish. It is about 70 percent Litro soils, 28 percent Haggerty soils, and 2 percent soils of minor extent.

Litro soils are poorly drained and have a surface layer of dark gray clay. The subsoil is light gray and light brownish gray, mottled clay.

Haggerty soils are somewhat poorly drained and have a surface layer of pale brown, mottled loamy fine sand or very dark grayish brown and grayish brown, mottled silty clay. The subsoil is light brownish gray and yellowish brown, mottled fine sandy loam and loamy fine sand. The underlying material is light gray, mottled sand.

Of minor extent in this unit are the poorly drained Groom and Perry soils and the somewhat poorly drained Mollicy soils. The Groom and Mollicy soils are on adjacent, low stream terraces, and the Perry soils are in backswamps.

The soils making up this unit are used mainly for wheat, grain sorghum, rice, and soybeans. In a few small to large areas, they are used as woodland.

The soils are poorly suited to cultivated crops and moderately well suited to pasture. The main limitations are wetness in spring, droughtiness in fall, low fertility, and high levels of aluminum that are potentially toxic to most crops. The soils are moderately well suited to the production of hardwood trees. Seedling mortality is a severe hazard, and wetness limits the use of equipment. The soils have good to very poor potential as habitat for wetland wildlife and fair potential for woodland and openland wildlife. The soils are poorly suited to urban uses. The main limitations are wetness, flooding, high shrink-swell potential, and very slow permeability.

7. Litro-Haggerty, Flooded

Poorly drained and somewhat poorly drained, level, frequently flooded, clayey and sandy soils

This map unit consists of soils in backswamps and on former beaches of relict lakes on the flood plain of the Ouachita River. The soils are frequently flooded. In most areas, slopes are long and smooth and range from 0 to 2 percent.

This unit covers about 1.5 percent of the parish. It is about 68 percent Litro, flooded, soils; 28 percent Haggerty, flooded, soils; and 4 percent soils of minor extent.

Litro, flooded, soils are poorly drained and have a surface layer of dark gray clay. The subsoil is gray and light brownish gray, mottled clay.

Haggerty, flooded, soils are somewhat poorly drained and have a surface layer of dark grayish brown and grayish brown, mottled loamy fine sand or dark gray and gray, mottled silty clay. The subsoil is mottled, grayish and brownish fine sandy loam and loamy fine sand. The underlying material is light gray, mottled loamy fine sand.

Of minor extent in this unit are the poorly drained Groom and Perry soils and the somewhat poorly drained Mollicy soils. The Groom and Mollicy soils are on adjacent, low, stream terraces. The Perry soils are in backswamps.

The soils making up this unit are mainly in woodland. They are used for timber production and habitat for wildlife.

The soils are moderately well suited to the production of hardwood trees, although wetness and frequent flooding limit the use of equipment. Seedling mortality is a problem. The soils are poorly suited to cultivated crops and pasture. Wetness, flooding, and low fertility are the main limitations. The soils are generally unsuited to urban uses because of the hazard of frequent flooding.

8. Guyton-Cascilla, Flooded

Poorly drained and well drained, level, frequently flooded, loamy soils

This map unit consists of soils in the narrow bottom lands of streams that drain the terrace uplands. The soils are frequently flooded. Slopes range from 0 to 1 percent.

This unit covers about 1.5 percent of the parish. It is about 70 percent Guyton soils, 20 percent Cascilla soils, and 10 percent soils of minor extent.

Guyton soils are poorly drained and have a surface layer of dark grayish brown and light brownish gray silt loam. The subsoil is mottled grayish brown and light brownish gray silt loam and silty clay loam.

Cascilla soils are well drained and have a surface layer of dark brown silt loam. The subsoil is mottled, dark yellowish brown, dark brown, and dark yellowish brown silt loam.

Of minor extent in this unit are the somewhat poorly drained Frizzell, Portland, and Tillou soils and the poorly drained Perry soils. The Frizzell and Tillou soils are on the adjacent terrace uplands, and the Perry and Portland soils are on flood plains.

The soils making up this unit are used mainly as woodland. In a few small areas, they are used as pasture.

The soils are moderately well suited to the production of pine trees, although wetness and frequent flooding limit the use of equipment. The soils are poorly suited to cultivated crops and pasture. Wetness, flooding, and low fertility are the main limitations. The soils have fair potential as habitat for woodland wildlife and good potential for wetland wildlife. The soils are generally not suited to urban uses because of the hazard of frequent flooding.

Areas dominated by level to moderately sloping soils on terrace uplands

The two map units in this group consist mainly of loamy soils on ridgetops, side slopes, and broad flats on the terrace uplands. Some of the soils are on the flood plains of small streams that drain the terrace uplands. Slopes range from 0 to 8 percent.

The two units cover about 21 percent of the parish. Most of the acreage is woodland. Equipment use is limited by wetness in places. Wetness, slope, and low fertility are the main limitations for cultivated crops and pasture. Wetness, slope, flooding, low strength as it affects local roads and streets, slow permeability, and moderate shrink-swell potential are limitations for most urban uses.

9. Frizzell-Libuse-Debute

Somewhat poorly drained and moderately well drained, level to moderately sloping, loamy soils

This map unit consists of soils on broad flats and on ridgetops and side slopes of the terrace uplands. The landscape in about half of the area is one of long, smooth slopes of 0 to 1 percent. In the other half, it is ridgetops and side slopes that have slopes of 1 to 8 percent.

This unit covers about 11 percent of the parish. It is about 49 percent Frizzell soils, 29 percent Libuse soils, 15 percent Debute soils, and 7 percent soils of minor extent.

Frizzell soils are somewhat poorly drained and level. They have a surface layer of dark brown silt loam. The subsoil is mottled, pale brown, yellowish brown, and light yellowish brown silt loam and silty clay loam.

Libuse soils are moderately well drained and very gently sloping and gently sloping. They have a surface layer of dark grayish brown and dark brown silt loam. The subsoil in the upper part is mottled yellowish brown and strong brown silt loam and silty clay loam. The lower part of the subsoil is a fragipan of mottled, yellowish brown and strong brown silt loam.

Debute soils are moderately well drained and very gently sloping to moderately sloping. They have a surface layer of dark brown silt loam. The subsoil is yellowish red silt loam and silty clay loam in the upper part. It has a fragipan of reddish brown and red silt loam, silty clay loam, and loam in the lower part.

Of minor extent in this unit are the moderately well drained Bussy soils, the somewhat poorly drained Tillou soils, and the poorly drained Guyton soils. The Bussy and Tillou soils are on side slopes and ridgetops, and the Guyton soils are in the bottom lands along small streams.

The soils making up this unit are used mainly for woodland. In a few small areas they are used for cultivated crops and pasture, and in a few others they are used for urban structures.

The soils are well suited to the production of pine trees. They have few limitations for this use. The soils are moderately well suited to cultivated crops. The main limitations are wetness, slope, low fertility, and high and moderately high levels of aluminum that are potentially toxic to crops. The soils are well suited to pasture, although lime and fertilizer are needed for optimum production. The soils have good potential as habitat for openland and woodland wildlife. The soils are moderately well suited to urban uses. The main limitations are wetness, low strength as it affects local roads and streets, slow permeability, and moderate shrink-swell potential.

10. Bussy-Tillou-Guyton

Moderately well drained to poorly drained, moderately sloping to level, loamy soils

This map unit consists of soils on ridgetops, side slopes, and broad flats of the terrace uplands and soils in bottom lands along streams that drain the terrace uplands. Slopes range from 1 to 8 percent on the ridgetops and side slopes and from 0 to 2 percent on the broad flats and bottom lands.

This unit covers about 10 percent of the parish. It is about 50 percent Bussy soils, 35 percent Tillou soils, 13 percent Guyton soils, and 2 percent soils of minor extent.

Bussy soils are moderately well drained and gently sloping and moderately sloping. They have a surface layer of dark yellowish brown and brown silt loam. The subsoil is yellowish brown silt loam in the upper part. In the lower part it has a fragipan of yellowish brown silt loam and silty clay loam.

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

Guyton soils are poorly drained and level. They have a surface layer of brown, dark grayish brown, and light brownish gray silt loam. The subsurface layer is light brownish gray, mottled silt loam. The subsoil is grayish brown and light brownish gray silt loam and silty clay loam.

Of minor extent are the moderately well drained Debute and Libuse soils and the somewhat poorly drained Frizzell soils. These soils are on ridgetops, side slopes, and broad flats of the terrace uplands.

The soils making up this unit are used mainly for woodland. In a few small areas they are used for pasture and cultivated crops, and in a few others they are used for urban structures.

The soils are well suited to the production of pine and hardwood trees. Wetness limits the use of equipment in areas of the Guyton soils. The soils are moderately well suited to cultivated crops. Slope, low fertility, wetness, and high levels of aluminum in the root zone are the main limitations. Flooding is also a hazard in some areas of the Guyton soils. The soils are well suited to pasture. Wetness, low fertility, and slope are the main limitations. The soils have good to poor potential as habitat for openland wildlife and fair to good potential for woodland wildlife. Areas of the Guyton soils also have good potential as habitat for wetland wildlife. The soils are moderately well suited to urban uses. The main limitations are wetness, flooding, low strength as it affects local roads and streets, slope, slow permeability, and moderate shrink-swell potential.

Areas dominated by level soils on low stream terraces

The two map units in this group consist mainly of loamy soils on broad flats and undulating areas on low stream terraces. Slopes range from 0 to 1 percent on the broad flats and from 0 to 5 percent in the undulating areas.

The two units cover about 5.5 percent of the parish. Most of the acreage is used for the production of pine and hardwood trees. Wetness and flooding are the main limitations for woodland and for most agricultural and urban uses.

11. Groom-Wrightsville

Poorly drained, level, loamy soils

This map unit consists of soils on broad flats and undulating areas on low stream terraces. Slopes are long and smooth and range from 0 to 1 percent on the broad flats.

This unit covers about 3 percent of the parish. It is about 58 percent Groom soils, 40 percent Wrightsville soils, and 2 percent soils of minor extent.

Groom soils have a surface layer of dark grayish brown very fine sandy loam or silt loam. The subsoil is mottled, gray and yellowish brown loam, silt loam, and silty clay loam.

Wrightsville soils have a surface layer of dark grayish brown silt loam. The subsurface layer is light brownish gray, mottled, silt loam. The subsoil is gray and light brownish gray, mottled silty clay. The underlying material is gray, mottled silty clay.

Of minor extent are the poorly drained Litro and Guyton soils and the somewhat poorly drained Mollicy soils. These soils are on flood plains and on low ridges and knolls on low stream terraces.

The soils making up this unit are used mainly for woodland. In a few small areas, they are in cultivated crops and pasture.

The soils are moderately well suited to the production of pine and hardwood trees, although wetness limits the use of equipment. The soils are poorly suited to cultivated crops. Wetness, low fertility, and high levels of aluminum in the root zone are the main limitations. The soils are moderately well suited to pasture. Wetness and low fertility are the main limitations. The soils have fair potential as habitat for openland and woodland wildlife and fair or good potential for wetland wildlife. The soils are poorly suited to urban uses. The main limitations are wetness, flooding, low strength as it affects local roads and streets, moderately slow and very slow permeability, and high shrink-swell potential.

12. Groom, Flooded

Poorly drained, level, occasionally flooded, loamy soils

This map unit consists of soils on broad flats and in undulating areas on low stream terraces. Slopes are long and smooth and range from 0 to 1 percent on the broad flats.

This unit covers about 2.5 percent of the parish. It is about 95 percent Groom, flooded, soils and 5 percent soils of minor extent.

Groom, flooded, soils have a surface layer of dark grayish brown very fine sandy loam or silt loam. The subsoil is a mottled grayish and brownish silt loam and silty clay loam.

Of minor extent are the poorly drained Guyton, Litro, and Perry soils and the somewhat poorly drained Mollicy and Portland soils. These soils are mainly on flood plains and on ridges and knolls on low stream terraces.

The soils making up this unit are used mainly for woodland. In a few small areas, they are in pasture.

The soils are moderately well suited to the production of pine and hardwood trees. Wetness from a seasonal high water table and flooding limits the use of equipment. The soils are moderately well suited to pasture and poorly suited to cultivated crops. The main limitations are wetness, low fertility, and high levels of aluminum in the root zone. The soils have fair potential as habitat for openland, woodland, and wetland wildlife. The soils are poorly suited to most urban uses. The main limitations are wetness, flooding, low strength as it affects local roads and streets, and moderately slow permeability.

Detailed Soil Map Units

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

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

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series.* Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

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

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

A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Mer Rouge-Gallion complex is an example.

A *soil association* is made up of two or more geographically associated soils that are shown as one unit on the maps. Because of present or anticipated soil uses in the survey area, it was not considered practical or necessary to map the soils separately. The pattern and relative proportion of the soils are somewhat similar. Udalfs-Bussy association, 5 to 30 percent slopes, is an example.

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

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

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

The boundaries of map units in Morehouse Parish were matched, wherever possible, with those of previously published surveys of Ouachita Parish, La., and Ashley County, Ark. In a few places the lines do not join, and there are some differences in the names of the map units. These differences resulted mainly from changes in soil series concepts, differences in map unit design, and changes in soil patterns near the survey area boundaries. The boundaries of map units in Morehouse Parish were not matched with those of the previously published survey of West Carroll Parish, La., because the two parishes are separated by a wide, perennial stream.

On the detailed soil maps all of the soil areas in Morehouse Parish were mapped at the same level of detail, except for areas of Hebert and Perry soils, frequently flooded, and Udalfs-Bussy association, 5 to 30 percent slopes. Frequent flooding so limits the use and management of the areas of Hebert and Perry soils, frequently flooded, and steep slopes so limit the use of the Udalfs-Bussy association, 5 to 30 percent slopes, that separating each soil would be of little value to the land user. Where flooding or steep slopes is the overriding limitation for present and expected land uses, the individual soils were not mapped separately.

Soil Descriptions

Ad—Allemands muck, drained. This level, poorly drained, organic soil is in rim swamps and former stream channels on flood plains. Rim swamps are at the base of the escarpment between the uplands and the flood plain. This soil is mainly between terrace uplands and Coulee Bayou. It is artificially drained, but is subject to rare flooding. Areas range from about 40 to 300 acres. Slopes are less than 1 percent.

Typically, the soil is black, dark brown, and very dark grayish brown, strongly acid and extremely acid muck to a depth of about 36 inches. The underlying material, to a depth of about 65 inches, is gray, extremely acid, semifluid clay. In some places the thickness of the organic upper part of the soil is 16 inches or less. In other places it is 51 inches or more.

This Allemands soil has high fertility. Water and air move moderately rapidly through the organic layers and very slowly through the underlying mineral layer. Water runs off the surface at a very slow rate and ponds for short periods after heavy rains. Flooding is rare, but this soil can be flooded for brief periods after unusually heavy rains. The water table fluctuates between depths of 1 foot and 4 feet throughout the year. Adequate water is available for crops in most years.

Most areas of this soil are used for cultivated crops. The soil is poorly suited to most crops. Grain sorghum is the main crop. This soil is limited mainly by wetness and subsidence. The surface layer is easy to work, and it can be worked over a wide range of moisture content. Buried logs, stumps, and roots are exposed, however, as the soil decays and subsides. Proper row direction, ditches, and grassed outlets are needed to remove excess water. Maintaining the water table at a depth of less than 3 feet will help to reduce the rate of subsidence of the organic material. This soil becomes more acid as the organic materials oxidize, making additions of lime necessary for the production of most crops.

This soil is moderately well suited to pasture. The main limitations are wetness and subsidence. Suitable pasture plants are common bermudagrass, dallisgrass, ryegrass, and tall fescue. Proper stocking rates, pasture rotation, and restricted use during wet periods will help keep the pasture in good condition.

This soil is moderately well suited to woodland. No areas remain in woodland, however, and the soil is not likely to be used for the production of commercial trees.

This soil has good potential as habitat for wetland wildlife and fair potential for openland and woodland wildlife. Habitat for wetland wildlife can be improved by constructing shallow ponds to provide open water areas for waterfowl and furbearers.

This soil is poorly suited to urban development. It has severe limitations for building sites, local roads and streets, recreational development, and sanitary facilities. The main limitations are flooding, subsidence, wetness, and low strength. Foundations for buildings require piling, and local roads and streets are difficult to construct and maintain because of the low strength of the organic material and the underlying semifluid clay. Septic tank absorption fields will not function properly because of the wetness.

This soil is in capability subclass IVw. It is not assigned to a woodland group.

Bs—Bussy silt loam, 1 to 5 percent slopes. This gently sloping, moderately well drained soil is on side slopes and convex ridgetops of terrace uplands. Areas range from about 15 to 1,200 acres.

Typically, the surface layer is dark yellowish brown, strongly acid silt loam about 4 inches thick. The subsoil to a depth of about 35 inches, is yellowish brown, very strongly acid silt loam. The lower part of the subsoil, to a depth of about 65 inches, is a fragipan of yellowish brown, strongly acid and medium acid silt loam and silty clay loam.

Included with this soil in mapping are a few small areas of Debute, Guyton, and Tillou soils. These areas make up about 20 percent of the unit. Debute soils are in lower positions and have a redder subsoil. The poorly drained Guyton soils are along drainageways and in depressional areas on stream terraces. The somewhat poorly drained Tillou soils are in areas that are more level.

This Bussy soil has low fertility. It has high levels of exchangeable aluminum in the root zone that are potentially toxic to most crops. Water and air move through this soil at a moderate rate in the upper part of the soil and at a slow rate in the fragipan. Water runs off the surface at a medium rate. Water is perched above the fragipan from December through March. Plants are damaged by lack of water during dry periods in summer and fall of most years. This soil has a moderate shrink-swell potential.

This soil is mainly in woodland. A small acreage is used for crops, pasture, homesites, and wildlife habitat.

This soil is well suited to the production of loblolly pine and slash pine. It has few limitations for use and management. Plant competition delays natural regeneration but does not prevent the eventual development of a fully stocked, normal stand of trees. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling to eliminate unwanted weeds, brush, or trees.

This soil is well suited to pasture. Suitable pasture plants are Pensacola bahiagrass, common bermudagrass, Coastal bermudagrass, ball clover, and crimson clover. Seedbed preparation should be on the contour or across the slope. Fertilizer and lime are needed for optimum forage production. Periodic mowing and clipping helps to maintain uniform growth, discourages selective grazing, and reduces clumpy growth.

This soil is moderately well suited to cultivated crops. The main limitations are low fertility, high levels of exchangeable aluminum in the root zone, slope, and droughtiness during the summer months. Soybeans and truck crops are the main crops. Most crops respond to fertilization and liming programs designed to improve the fertility and overcome the potentially toxic effects of the exchangeable aluminum in the root zone. In areas where water of suitable quality is available, supplemental irrigation can prevent damage to crops during dry periods of most years. Crop residue left on or near the surface helps to conserve moisture, maintain tilth, and control erosion. All tillage should be on the contour or across the slope.

This soil is moderately well suited to recreational development. Wetness and slow permeability are the main limitations for this use. Erosion and sedimentation can be controlled and the beauty of the area enhanced by maintaining adequate plant cover. Cuts and fills should be seeded or mulched. Good drainage should be provided for intensively used areas such as playgrounds.

This soil has good potential as habitat for openland and woodland wildlife. There are few limitations for this use. Dominant wildlife are white-tailed deer, squirrels, rabbits, quail, dove, and raccoons. Management that enhances the growth of oak and other mast-producing trees will improve the habitat for white-tailed deer and squirrels.

This soil is moderately well suited to urban development. The main limitations are wetness, low strength, slope, and slow permeability. A seasonal high water table is perched above the fragipan, and drainage should be provided if buildings are constructed. Homesite development should be done in a way that preserves as much of the existing plant cover as possible. Revegetating disturbed areas around construction sites as soon as possible helps to reduce erosion. Where deep cuts have exposed the fragipan, it is difficult to establish plants. Mulching and fertilizing cut areas help to establish plants. Septic tank absorption fields may not function properly because of the slow permeability, but this limitation can be overcome by increasing the size of the field. Roads should be designed to offset the limited ability of the soil to support a load.

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

Db—Debute silt loam, 1 to 3 percent slopes. This very gently sloping, moderately well drained soil is on ridgetops and side slopes of terrace uplands. Areas range from about 10 to 100 acres.

Typically, the surface layer is dark brown, strongly acid silt loam about 10 inches thick. The upper part of the subsoil is yellowish red, strongly acid silty clay loam. The lower part of the subsoil, to a depth of about 70 inches, is a fragipan of reddish brown, strongly acid loam.

Included with this soil in mapping are a few small areas of Frizzell, Guyton, and Libuse soils. These areas make up about 15 percent of the unit. The Frizzell soils are on positions that are more level, are somewhat poorly drained, and do not have a fragipan. The Guyton soils are in drainageways and depressional areas, are poorly drained, and do not have a fragipan. The Libuse soils are in similar positions and have a redder subsoil. Also included are a few small areas of Debute soils on slopes of 3 to 5 percent.

This Debute soil has low fertility. It has moderately high levels of exchangeable aluminum in the root zone that are potentially toxic to most crops. Water and air move through the upper part of this soil at a moderate rate and through the lower part at a slow rate. Plants are damaged by lack of water during dry periods in summer and fall of most years. Water runs off the surface at a medium rate. This soil has a moderate shrink-swell potential. A seasonal high water table is perched above the fragipan from December through March.

Most areas are in woodland. A small acreage is used for cultivated crops, pasture, and homesites.

This soil is well suited to the production of loblolly pine and slash pine. It has few limitations for use and management. Plant competition delays natural regeneration but does not prevent the eventual development of a fully stocked, normal stand of trees. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling to eliminate unwanted weeds, brush, or trees.

This soil is well suited to pasture. The main suitable pasture plants are Coastal bermudagrass, common bermudagrass, improved bermudagrass, Pensacola bahiagrass, ball clover, crimson clover, and arrowleaf clover. Fertilizer and lime are needed for optimum forage production. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture in good condition.

This soil is moderately well suited to cultivated crops. The main limitations are low fertility, slope, moderately high levels of exchangeable aluminum in the root zone, and droughtiness during the summer months. Cotton, soybeans, and truck crops are the main crops. Most crops respond to fertilization and liming programs designed to improve the fertility and overcome the potentially toxic effects of the exchangeable aluminum in the root zone. Practices that can be used to reduce erosion include early fall seeding, minimum tillage, and construction of terraces, diversions, and grassed waterways.

This soil is moderately well suited to recreational development. Wetness and the slow permeability are the main limitations. Cuts and fills should be seeded or mulched. Erosion and sedimentation can be controlled and the beauty of the area enhanced by maintaining adequate plant cover. Good drainage should be provided for intensively used areas such as playgrounds.

This soil has good potential as openland and woodland wildlife habitat. It has few limitations for this use. The main wildlife include white-tailed deer, quail, squirrel, and rabbits. Planting oaks and other mast-producing trees helps to improve the habitat for white-tailed deer and squirrels.

This soil is moderately well suited to urban development. Wetness, slow permeability, and moderate shrink-swell potential are the main limitations. The slow permeability is a limitation for septic tank absorption fields, but this limitation can be overcome by increasing the size of the field. Preserving the existing plant cover during construction helps to reduce erosion. Homesite development should be done in a way that preserves as many trees as possible. It is difficult to establish plants in areas where the fragipan has been exposed during earth-moving operations. Mulching and fertilizing cut areas help to establish plants.

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

De—Debute silt loam, 3 to 8 percent slopes. This moderately sloping, moderately well drained soil is on ridgetops and side slopes of terrace uplands. Areas range from about 10 to 500 acres.

Typically, the surface layer is dark brown, medium and strongly acid silt loam about 8 inches thick. The subsoil is yellowish red, strongly acid silt loam and very strongly acid silty clay loam to a depth of about 27 inches. Below this, to a depth of about 90 inches, the subsoil is a fragipan of reddish brown and red, strongly acid silt loam, loam, and sandy clay loam.

Included with this soil in mapping are a few small areas of Frizzell, Guyton, and Libuse soils. These areas make up about 15 percent of the unit. The Frizzell soils are in positions that are more level, are somewhat poorly drained, and do not have a fragipan. The Guyton soils are in drainageways and depressional areas, are poorly drained, and do not have a fragipan. Libuse soils are in similar positions and have a yellower subsoil. Also included are a few small areas of Debute soils on slopes that exceed 8 percent.

This Debute soil has low fertility. It has moderately high levels of exchangeable aluminum in the root zone that are potentially toxic to some crops. Water and air move through the upper part of this soil at a moderate rate and through the lower part at a slow rate. Plants are damaged by lack of water during dry periods in summer and fall of most years. Water runs off the surface at a rapid rate. This soil has a moderate shrink-swell potential. A seasonal high water table is perched above the fragipan from December to March.

Most areas are in woodland. A small acreage is used for pasture, cultivated crops, and homesites.

This soil is well suited to pasture. The main limitations are slope and low fertility. Suitable pasture plants are Coastal bermudagrass, common bermudagrass, improved bermudagrass, Pensacola bahiagrass, ball clover, crimson clover, and arrowleaf clover. Fertilizer and lime are needed for optimum forage production. Seedbed preparation should be on the contour or across the slope.

This soil is moderately well suited to cultivated crops. The main limitations are slope, low fertility, moderately high levels of exchangeable aluminum in the root zone, and droughtiness during the summer. Cotton, soybeans, and truck crops are the main crops. Most crops respond to fertilization and liming programs designed to improve the fertility and overcome the potentially toxic effects of the exchangeable aluminum in the root zone. Limiting tillage for seedbed preparation helps to reduce runoff and erosion. Erosion on the steeper slopes can be reduced by constructing terraces and grassed waterways, and then farming on the contour.

This soil is well suited to the production of loblolly pine and slash pine. It has few limitations for use and management. Management that minimizes the risk of erosion is essential in harvesting timber. Plant competition delays natural regeneration but does not prevent the eventual development of a fully stocked, normal stand of trees. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling to eliminate unwanted weeds, brush, or trees.

This Debute soil is moderately well suited to recreational development. It is limited mainly by slope, wetness, and slow permeability. Cuts and fills should be seeded or mulched. Erosion and sedimentation can be reduced and the beauty of the area enhanced by maintaining adequate plant cover.

This soil has good potential as habitat for openland and woodland wildlife habitat. It produces habitat for white-tailed deer, quail, squirrel, and rabbits. Management that increases the number of oaks and other mast-producing trees will improve the habitat for white-tailed deer and squirrel.

This soil is moderately well suited to urban uses. The main limitations are wetness, slope, slow permeability, and low strength. Preserving the existing plant cover during construction and revegetating disturbed areas as soon as possible help reduce erosion. Where deep cuts have exposed the fragipan, it is difficult to establish plants. Mulching and fertilizing help to establish plants in these areas. The slow permeability is a limitation to septic tank absorption fields, but this limitation can be overcome by increasing the size of the field. Effluent from absorption fields can surface in downslope areas and create a hazard to health. A seasonal high water table is perched above the fragipan, and drainage should be provided if buildings are constructed.

This soil is in capability subclass IVe and woodland group 2o7.

Dx—Dexter silt loam, 3 to 5 percent slopes. This gently sloping, well drained soil is on long, narrow, convex ridges that parallel the Boeuf River. Areas range from about 10 to 100 acres.

Typically, the surface layer is about 7 inches thick. It is brown, strongly acid silt loam in the upper part and yellowish brown, medium acid silt loam in the lower part. The upper part of the subsoil is dark brown and reddish brown, medium acid and strongly acid silt loam and silty clay loam. The lower part is yellowish red, strongly acid clay loam and dark brown, medium acid fine sandy loam. The underlying material, to a depth of about 87 inches, is dark brown, medium acid loamy fine sand.

Included with this soil in mapping are a few small areas of the poorly drained Forestdale soils, the moderately well drained Goodwill soils, and the somewhat poorly drained Idee soils. All of these soils are in lower positions than the Dexter soils. Also included are a few small areas of Dexter soils on slopes that range from 5 to 8 percent. These included areas make up about 10 percent of the unit.

This Dexter soil has medium fertility. Water and air move through this soil at a moderate rate. Water runs off the surface at a medium rate. Plants roots penetrate the soil easily. Adequate water is available to plants in most years. This soil has a low shrink-swell potential.

Most areas are in cultivated crops. A small acreage is used for pasture, hayland, and homesites.

This soil is moderately well suited to cultivated crops. The main suitable crops are cotton, soybeans, wheat, oats, truck crops, and corn. The main limitation is slope. This soil is friable and easy to keep in good tilth. It can be worked over a wide range of moisture content. Traffic pans develop easily, but these can be broken up by deep plowing or chiseling. Conservation practices such as contour farming, minimum tillage, and proper management of crops help to reduce erosion. Most crops other than legumes respond well to additions of lime and fertilizer.

This soil is well suited to pasture. The main suitable pasture plants are common bermudagrass, improved bermudagrass, ryegrass, dallisgrass, Pensacola bahiagrass, ball clover, and crimson clover. Fertilizer and lime are needed for optimum forage production. Seedbed preparation should be on the contour or across the slope where practical.

This soil is well suited to woodland. It has few limitations for this use. Few areas, however, remain in woodland. The potential productivity for loblolly pine is high.

This soil has good potential as habitat for openland and woodland wildlife. Habitat can be created or improved by providing undisturbed areas that are planted to appropriate vegetation.

This soil is well suited to urban uses. The main limitations are moderate permeability and low strength. Base material for roads can be replaced or strengthened to overcome the limited load-supporting capacity of the soil. Increasing the size of septic tank absorption fields helps to overcome the limitation of moderate permeability. Seepage of effluent can be a problem where sanitary landfills are constructed. This limitation can be overcome by sealing the bottoms and sides of the trench with clay or other impermeable materials.

This soil is moderately well suited to recreational development. The main limitation is slope.

This soil is in capability subclass IIIe and woodland group 2o7.

Fo—Forestdale silty clay loam. This level, poorly drained soil is in depressional areas on flood plains. It is mainly in the eastern part of the parish between Bayou Bonne Idee and the Boeuf River. Areas range from about 10 to 300 acres. Slopes are dominantly less than 1 percent.

Typically, the surface layer is dark grayish brown, medium acid silty clay loam about 6 inches thick. The subsoil is light gray, mottled, strongly acid and medium acid silty clay and silty clay loam in the upper part. The lower part, to a depth of about 60 inches, is light brownish gray, mottled, slightly acid silty clay loam.

Included with this soil in mapping are a few small areas of Goodwill, Hebert, Idee, Perry, and Portland soils. These areas make up about 20 percent of the unit. The Goodwill and Idee soils are in higher positions and have a less clayey subsoil. The Hebert soils are in similar positions and have a less clayey subsoil. The Perry and Portland soils are in lower positions and have a redder subsoil.

This Forestdale soil has medium fertility. Water and air move through this soil at a very slow rate. Water runs off the surface at a slow to very slow rate and stands in low places for long periods after heavy rains. A seasonal high water table fluctuates between depths of 1/2 foot and 2 feet during January through April. Flooding is rare, but it can occur after high-intensity rains of long duration. This soil has a high shrink-swell potential in the subsoil.

Most of the acreage is used for cultivated crops. A small acreage is used for pasture and homesites.

This soil is moderately well suited to cultivated crops. The surface layer is difficult to keep in good tilth and can be worked only within a narrow range of moisture content. Wetness, very slow permeability, and poor tilth are the main limitations. Soybeans, grain sorghum, rice, and wheat are the main crops. Proper row arrangement, field drains, and grassed outlets are needed to remove excess surface water. Land grading and smoothing will also improve surface drainage. Returning crop residue to the soil or regularly adding other organic matter improves fertility, improves tilth, and increases the water intake rate. Most crops respond well to fertilizer.

This soil is well suited to pasture. Suitable pasture plants are common bermudagrass, dallisgrass, Pensacola bahiagrass, johnsongrass, tall fescue, white clover, vetch, and winter peas. Grazing when the soil is wet results in compaction of the surface layer and damage to the plant cover. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture and soil in good condition. Periodic mowing and clipping helps to maintain uniform growth, discourages selective grazing, and reduces clumpy growth. Fertilizer and lime are needed for optimum growth of grasses and legumes.

This soil is well suited to woodland. It has very high potential for the production of southern hardwoods. Only a few areas, however, remain in woodland. Suitable trees to plant are green ash, eastern cottonwood, Nuttal oak, sweetgum, and American sycamore. Wetness limits the use of equipment during planting and harvesting operations. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling to eliminate unwanted weeds, brush, or trees.

This soil has fair potential as habitat for openland and woodland wildlife and good potential as habitat for wetland wildlife. Encouraging the growth of oaks and other mast-producing trees can improve the habitat for white-tailed deer and squirrels. Habitat for openland wildlife such as dove, quail, and rabbits can be improved by providing undisturbed, vegetated areas near cultivated fields. Habitat for waterfowl and furbearers can be created by constructing shallow ponds.

This soil is poorly suited to urban and recreational development. The main limitations are wetness, flooding, very slow permeability, high shrink-swell potential, and low strength as it affects local roads and streets. Septic tank absorption fields do not function properly during rainy periods because of the wetness and very slow permeability. Drainage is needed if roads and building foundations are constructed. Excess water can be removed by using shallow drains and providing the proper grade for drainage. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has a low shrink-swell potential. Roads should be designed to offset the limited ability of the soil to support a load.

This soil is in capability subclass IIIw and woodland group 1w6.

Fr—Frizzell silt loam. This level, somewhat poorly drained soil is in broad flats on terrace uplands. Areas range from about 20 to 1,000 acres. Slopes are dominantly less than 1 percent.

Typically, the surface layer is dark brown, strongly acid silt loam about 4 inches thick. The upper part of the subsoil, to a depth of about 48 inches, is mottled, light yellowish brown and pale brown, very strongly acid and strongly acid silt loam that contains tongues of light brownish gray silt loam. The middle part of the subsoil is yellowish brown, mottled, strongly acid silty clay loam. The lower part, to a depth of about 76 inches, is yellowish brown, mottled, strongly acid silt loam.

Included with this soil in mapping are a few small areas of Guyton, Libuse, and Wrightsville soils. These areas make up about 15 percent of the unit. The poorly drained Guyton soils are in drainageways and depressional areas on the terrace uplands and are grayer throughout. The moderately well drained Libuse soils are on higher positions and have a fragipan. The poorly drained Wrightsville soils are on broad flats and have a more clayey subsoil.

This Frizzell soil has low fertility. It has high levels of exchangeable aluminum in the root zone that are potentially toxic to most crops. Water and air move through this soil at a slow rate. Water runs off the surface at a slow rate. A seasonal high water table fluctuates between depths of 1 1/2 and 4 feet during December through April. Plants are damaged by lack of water during dry periods in summer and fall of most years. This soil has a low shrink-swell potential.

Most of the acreage is in woodland. A small acreage is used for pasture crops and homesites.

This soil is moderately well suited to cultivated crops. The main limitations are wetness, low fertility, and potentially toxic levels of exchangeable aluminum in the root zone. The main crops are soybeans and truck crops. A drainage system is needed for most cultivated crops. Most crops respond to fertilization and liming programs designed to improve the fertility and overcome the potentially toxic effects of the exchangeable aluminum in the root zone. Where water of suitable quality is available, supplemental irrigation can prevent the damage to crops that results during dry periods of most years.

This soil is well suited to pasture. The main limitations are wetness and low natural fertility. Suitable pasture plants are common bermudagrass, Coastal bermudagrass, improved bermudagrass, Pensacola bahiagrass, ryegrass, tall fescue, white clover, vetch, and winter peas. Grazing when the soil is wet results in compaction of the surface layer and damage to the plant cover. Proper grazing practices, weed control, and additions of fertilizer are needed for optimum growth of grasses and legumes.

This soil is well suited to the production of loblolly pine and slash pine. Reforestation, after harvesting, must be carefully managed to reduce competition from undesirable understory plants. Conventional methods of harvesting timber generally are suitable, but the soil may be compacted if it is wet and heavy equipment is used.

This soil has good potential as habitat for woodland and openland wildlife and fair potential for wetland wildlife. Woodland wildlife habitat is easily improved and maintained. In addition, there are few soil limitations to developing openland wildlife habitat. Dominant wildlife are white-tailed deer, squirrels, quail, turkeys, rabbits, and raccoons. Management that favors the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrel.

This soil is moderately well suited to urban and recreational development. Wetness and slow permeability are the main limitations. Drainage is needed if roads and building foundations are constructed. Excess water can be removed by using shallow drains and providing the proper grade for drainage. Septic tank absorption fields do not function properly during rainy periods because of the wetness and slow permeability.

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

Ga—Gallion silt loam. This level, well drained soil is on natural levees bordering Bayou Bartholomew, Bayou Bonne Idee, and other former channels and distributaries of the Arkansas River. Areas range from about 10 to 1,500 acres. Slopes are dominantly less than 1 percent.

Typically, the surface layer is dark grayish brown, medium acid silt loam about 7 inches thick. The subsoil is brown, slightly acid silty clay loam in the upper part and brown, moderately alkaline silt loam in the middle and lower parts. The underlying material, to a depth of about 60 inches, is brown, moderately alkaline silt loam.

Included with this soil in mapping are a few small areas of Hebert, Mer Rouge, Perry, Rilla, and Sterlington soils. These areas make up about 10 percent of the unit. The Hebert soils are on the backslopes of natural levees and in swales and have a more acid subsoil. The Mer Rouge soils are in similar positions and have a darker surface layer. The Perry soils are in lower positions and are more clayey throughout. The Sterlington and Rilla soils are on higher positions and have a more acid subsoil. Also included are a few small areas of Gallion soils on slopes that range from 1 to 3 percent.

This Gallion soil has high fertility. Water and air move through this soil at a moderate rate. Plants are damaged by lack of water during dry periods in summer and fall of some years. Water runs off the surface at a slow rate. This soil has a moderate shrink-swell potential.

Most areas are in crops. A few areas are used for pasture and homesites.

This soil is well suited to cultivated crops. It has few limitations for this use. Cotton is the main crop, but soybeans, corn, small grains, and truck crops are also suitable. This soil is friable and easy to keep in good tilth. It can be worked over a wide range of moisture content. Land grading and smoothing will improve surface drainage and permit more efficient use of farm equipment. Excessive cultivation can result in the formation of a tillage pan, but this pan can be broken by deep plowing or chiseling when the soil is dry. Returning crop residue to the soil or regularly adding other organic matter improves fertility, reduces crusting, and increases the water intake rate (fig. 1). Nitrogen, phosphate, and potash fertilizers are needed for optimum crop production.

This soil is well suited to pasture. It has few limitations for this use. Suitable pasture plants are common bermudagrass, improved bermudagrass, Coastal bermudagrass, Pensacola bahiagrass, johnsongrass, white clover, red clover, vetch, and winter peas. Management is needed that maintains optimum vigor and quality of forage plants. Grazing when the soil is wet results in compaction of the surface layer. Fertilizer and lime are needed for sustained production of high-quality pasture.

This soil is well suited to woodland, but few areas remain in woodland. A few areas are in pecan orchards. This soil has few limitations for producing and harvesting timber. Trees suitable for planting are eastern cottonwood and American sycamore.

This soil has good potential as habitat for openland and woodland wildlife. Habitat for white-tailed deer and squirrels can be improved by planting oak and other mast-producing trees. Habitat for dove, quail, and rabbits can be improved by providing undisturbed, vegetated areas near cropland.

This soil is moderately well suited to building sites, local roads and streets, and most sanitary facilities. The main limitations are moderate shrink-swell potential, moderate permeability, and low strength as it affects local roads and streets. Buildings and roads can be designed to offset the effects of shrinking and swelling and the limited ability of the soil to support a load. Moderate permeability is a limitation for septic tank absorption fields, but this limitation can be overcome by increasing the size of the field.

This soil is well suited to recreational development. It has few limitations for playgrounds, picnic areas, and other recreational uses.

This soil is in capability class I and woodland group 2o4.

Gb—Gallion silty clay loam. This level, well drained soil is in low positions on natural levees bordering Bayou Bartholomew, Bayou Bonne Idee, and other former channels and distributaries of the Arkansas River. Areas range from about 10 to 100 acres. Slopes are dominantly less than 1 percent.

Typically, the surface layer is about 14 inches thick. It is dark yellowish brown, medium acid silty clay loam in the upper part and brown, medium acid silty clay loam in the lower part. The subsoil, to a depth of about 60 inches, is yellowish red, medium acid silt loam in the upper part; yellowish red, slightly acid silty clay loam in the middle part; and reddish brown, mildly alkaline silt loam in the lower part. Small concretions of lime are common in the lower part of the subsoil.

Included with this soil in mapping are a few small areas of Gallion silt loam and Hebert, Mer Rouge, and Portland soils. These areas make up about 15 percent of the unit. The Gallion silt loam is on slightly higher positions. The somewhat poorly drained Hebert soils are in slightly lower positions. The Mer Rouge soils are in slightly lower positions and have a darker surface layer.

Figure 1.—Returning cotton crop residue to Gallion silt loam helps to maintain fertility and reduces surface crusting.

The Portland soils are in lower positions and are more clayey throughout. Also included are a few small areas of Gallion soils on slopes of 1 to 3 percent.

This Gallion soil has high fertility. Water and air move through this soil at a moderate rate. Water runs off the surface at a slow rate. This soil has a moderate shrink-swell potential. The surface layer is slightly sticky when wet and hard when dry. Plants are damaged by lack of water during dry periods in summer and fall of some years.

Most areas are in cultivated crops. A small acreage is used for pasture and homesites.

This soil is well suited to cultivated crops. It is limited mainly by wetness and the silty clay loam surface texture. The main suitable crops are soybeans, cotton, and small grains. This soil is slightly sticky when wet and hard when dry, and it becomes somewhat cloddy if worked when it is too wet or too dry. Proper row arrangement, field ditches, and grassed outlets are needed to remove excess surface water. Land grading and smoothing will improve surface drainage and permit more efficient use of farm equipment. Returning all crop residue to the soil and using a cropping system that includes grasses, legumes, or grass-legume mixtures help to maintain fertility and tilth.

This soil is well suited to pasture. It has few limitations. Suitable pasture plants are common bermudagrass, improved bermudagrass, Coastal bermudagrass, Pensacola bahiagrass, johnsongrass, ryegrass, white clover, red clover, vetch, and winter peas. Management is needed that maintains optimum vigor and quality of forage plants. Grazing when the soil is wet results in compaction of the surface layer and damage to the plant cover. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture and soil in good condition. Fertilizer is needed for optimum growth of grasses and legumes.

This soil is well suited to woodland. It has few limitations for producing and harvesting timber. Few areas, however, remain in woodland. Trees suitable for planting are eastern cottonwood and American sycamore. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling to eliminate unwanted weeds, brush, or trees.

This soil has good potential as habitat for openland and woodland wildlife. There are few, if any, soil limitations for these uses. Habitat for white-tailed deer and squirrels can be created by planting oak trees. Habitat for dove, quail, and rabbits can be improved by providing undisturbed, vegetated areas near cropland.

This soil is moderately well suited to urban development. The main limitations are moderate shrink-swell potential, moderate permeability, and low strength. Excess water can be removed by using shallow ditches and providing the proper grade for drainage. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has a low shrink-swell potential. The moderate permeability of this soil is a limitation for septic tank absorption fields, but this limitation can be overcome by increasing the size of the field. Roads can be designed to offset the limited ability of this soil to support a load.

This soil is well suited to recreational development. It has few limitations for this use.

This soil is in capability subclass IIw and woodland group 2o4.

Gm—Groom very fine sandy loam. This level, poorly drained soil is on low stream terraces adjacent to the flood plain of the Ouachita River. Areas range from about 30 to 800 acres. Slopes are dominantly less than 1 percent.

Typically, the surface layer is dark grayish brown, neutral very fine sandy loam about 5 inches thick. The subsoil extends to a depth of about 78 inches. It is gray, mottled, extremely acid loam and silt loam in the upper part; yellowish brown, mottled, very strongly acid silt loam in the middle part; and gray, mottled, extremely acid silty clay loam in the lower part.

Included with this soil in mapping are a few small areas of Guyton, Mollicy, Portland, and Wrightsville soils. These areas make up about 20 percent of the unit. The Guyton soils are in drainageways and are grayer throughout the subsoil. The somewhat poorly drained Mollicy soils are on low ridges and have a browner subsoil. The Portland soils are in lower positions and are more clayey throughout. The Wrightsville soils are in similar positions and contain more clay in the lower part of the subsoil.

This Groom soil has low fertility. It contains high levels of exchangeable aluminum in the root zone that are potentially toxic to most crops. Water and air move through this soil at a moderately slow rate. Water runs off the surface at a slow rate and stands in low places for short periods after heavy rains. A seasonal high water table fluctuates between the surface and a depth of about 1 foot during November through July. Flooding is rare, but it can occur after unusually heavy rains of long duration. High levels of sodium are in the soil between depths of 40 and 78 inches. Plants are damaged by lack of water during dry periods in summer and fall of most years.

Most areas are in woodland. A few areas are used for crops and pasture.

This soil is poorly suited to cultivated crops. The main limitations are wetness and high levels of exchangeable aluminum in the root zone. Soybeans and rice are the main crops. A drainage system is needed for most cultivated crops. Most crops respond to fertility and liming programs designed to improve the fertility and overcome the potentially toxic effects of the exchangeable aluminum in the root zone. Maintaining crop residue on or near the surface helps to conserve moisture and maintain the tilth and content of organic matter. Where water of suitable quality is available, supplemental irrigation can prevent the damage to crops that results during dry periods of most years.

This soil is moderately well suited to pasture. The main limitations are wetness and low fertility. Suitable pasture plants are common bermudagrass, ryegrass, Pensacola bahiagrass, vetch, winter peas, and white clover. Grazing when the soil is wet results in compaction of the surface layer. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture and soil in good condition. Fertilizer and lime are needed for optimum growth of grasses and legumes.

This soil is moderately well suited to woodland. The potential production of loblolly pine, water oak, and sweetgum is moderately high. Wetness limits the use of equipment. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling to eliminate unwanted weeds, brush, or trees. Trees should be water tolerant, and they should be planted or harvested during dry periods. Trees commonly are subject to windthrow during periods when the soil is excessively wet and winds are strong.

This soil has fair potential as habitat for openland, woodland, and wetland wildlife. Management that enhances the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels. Constructing shallow ponds to provide open water areas improves the habitat for waterfowl and furbearers.

This soil is poorly suited to urban development. It has severe limitations for building sites, local roads and streets, and most sanitary facilities. The main limitations are wetness, flooding, moderately slow permeability, and low strength as it affects local roads and streets. Drainage is needed if roads and building foundations are constructed. Septic tank absorption fields do not function properly during rainy periods because of wetness and moderately slow permeability. Roads should be designed to offset the limited ability of the soil to support loads.

This soil is in capability subclass IIIw and woodland group 3w9.

Go—Groom very fine sandy loam, occasionally flooded. This level, poorly drained soil is in broad flats on low stream terraces adjacent to the flood plain of the Ouachita River. This soil is subject to occasional overflow from the Ouachita River, mainly during November through July. Areas range from about 50 to 400 acres. Slopes are dominantly less than 1 percent.

Typically, the surface layer is dark grayish brown, strongly acid very fine sandy loam about 4 inches thick. The subsoil extends to a depth of about 84 inches. It is gray, mottled, very strongly acid silt loam in the upper part. The middle part is yellowish brown, mottled, very strongly acid silt loam. The lower part is gray, mottled, very strongly acid silty clay loam.

Included with this soil in mapping are a few small areas of Litro, Mollicy, Perry, Portland, and Wrightsville soils. These areas make up about 5 percent of the unit. The Litro, Perry, and Portland soils are in lower positions and are more clayey throughout the subsoil. The Mollicy soils are on low ridges and have a browner subsoil. The Wrightsville soils are in similar positions and have a more clayey subsoil.

This Groom soil has low fertility. It has high levels of exchangeable aluminum in the root zone that are potentially toxic to most crops. Water and air move through this soil at a moderately slow rate. Water runs off the surface at a slow rate and stands in low places for long periods after heavy rains. A seasonal high water table fluctuates between the surface and a depth of about 1 foot during November through July. The soil is occasionally flooded by overflow from streams. The depth of floodwaters is generally less than 5 feet. Flooding between June 1 and November 30 occurs less often than 2 years out of 5. Plants are damaged by lack of water during dry periods in summer and fall of most years.

Most areas are in woodland. A small acreage is used for cultivated crops and pasture.

This soil is poorly suited to cultivated crops. It is limited mainly by wetness, flooding, and high levels of exchangeable aluminum in the root zone. The main crops are rice and small grain. Most crops respond to fertilization and liming programs designed to improve the fertility and overcome the potentially toxic effects of the exchangeable aluminum. Drainage is needed for most crops. A properly designed irrigation system is needed for growing rice. Returning all crop residue to the soil and using a cropping system that includes grasses and legumes help to maintain soil tilth and fertility.

This soil is moderately well suited to pasture. The main limitations are flooding, wetness, and low fertility. Suitable pasture plants are common bermudagrass, ryegrass, Pensacola bahiagrass, vetch, winter peas, and white clover. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture and soil in good condition. During flood periods, cattle should be moved to adjacent protected areas or to pastures at higher elevations. Fertilizer and lime are needed for optimum growth of grasses and legumes.

This soil is moderately well suited to the production of loblolly pine, water oak, and sweetgum. The main concerns in producing and harvesting timber are wetness and occasional overflow, especially during November through July. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling to eliminate unwanted weeds, brush, or trees. Trees should be water tolerant, and they should be planted or harvested during dry periods. Trees commonly are subject to windthrow during periods when the soil is excessively wet and winds are strong.

This soil has fair potential as habitat for openland, woodland, and wetland wildlife. Management that enhances the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels. Constructing shallow ponds to provide open water areas can improve the habitat for waterfowl and furbearers.

This soil is poorly suited to urban development. The main limitations are flooding, wetness, moderately slow permeability, and low strength. Flooding can be controlled by use of major flood-control structures. Roads and streets should be located above the expected flood level and designed to offset the limited ability of the soil to support a load. Septic tank absorption fields do not function properly during rainy periods because of the wetness and moderately slow permeability.

This soil is in capability subclass IVw and woodland group 3w9.

Gp—Groom-Mollicy complex. This complex consists of poorly drained Groom soils and somewhat poorly drained Mollicy soils. These soils are on low stream terraces along the Ouachita River. The soils are protected from most floods by levees and pump-off systems. The landscape is typically undulating. The Groom soils are in broad, level areas, and the Mollicy soils are on low knolls and ridges. The Groom soils make up about 70 percent of the complex, and the Mollicy soils about 20 percent. The Groom soils are on long, smooth slopes that range from 0 to 1 percent. The Mollicy soils are on short, choppy slopes that range from 0 to 5 percent. Areas of these soils are so intermingled that mapping them separately was not practical at the scale selected. Areas of this complex range from about 60 to 1,500 acres.

Typically, the Groom soils have a surface layer of dark grayish brown, strongly acid silt loam about 5 inches thick. The subsoil extends to a depth of about 75 inches. It is gray, mottled, extremely acid silt loam in the upper part; yellowish brown, mottled, very strongly acid silt loam in the middle part; and gray, mottled, extremely acid silty clay loam in the lower part.

The Groom soils have low fertility. They contain high levels of exchangeable aluminum in the root zone that are potentially toxic to most crops. Water and air move through these soils at a moderately slow rate. Water runs off the surface at a slow rate and stands in low places for long periods after heavy rains. A seasonal high water table fluctuates between the surface and a depth of about 1 foot during November through July. Flooding is rare, but it can occur after unusually heavy rains of long duration or when protection levees fail. Plants are damaged by lack of water during dry periods in summer and fall of most years. There are high levels of sodium between depths of 40 and 78 inches.

Typically, the Mollicy soils have a surface layer of brown, extremely acid loam about 5 inches thick. The subsoil, to a depth of about 90 inches, is yellowish brown and grayish brown, mottled, extremely acid loam and clay loam in the upper part and yellowish brown, strong brown, and brown, mottled, extremely acid sandy clay loam and fine sandy loam in the lower part.

The Mollicy soils have low fertility. They contain high levels of aluminum within the root zone that are potentially toxic to most crops. Water and air move through these soils at a moderately slow rate. Water runs off the surface at a medium rate. A seasonal high water table fluctuates between depths of about 1 1/2 and 3 feet during November through June. Flooding is rare, but it can occur after unusually heavy rains of long duration or when levees fail. Plants are damaged by lack of water during dry periods in summer and fall of most years.

Included with this unit in mapping are a few small areas of Haggerty, Litro, Perry, and Wrightsville soils. These areas make up about 10 percent of the unit. The Haggerty soils are in lower positions and are sandy throughout. The Litro and Perry soils are in lower positions and are clayey throughout. The Wrightsville soils are in higher positions and have a more clayey subsoil than the Groom and Mollicy soils.

Most areas of these Groom and Mollicy soils are used for cultivated crops. A small acreage is in pasture and woodland.

These soils are poorly suited to cultivated crops, mainly soybeans and rice. They are limited mainly by wetness, high levels of aluminum, and low fertility. Land grading and smoothing can help to remove excess water. Deep cuts during land grading and smoothing operations, however, can expose the subsoil in the Groom soil, which is high in content of sodium. Returning crop residue to the soil or regularly adding other organic matter improves fertility, reduces crusting, and increases the water intake rate. A drainage system is needed for most crops. Crops respond to fertilization and liming programs designed to improve the fertility and overcome the potentially toxic effects of the exchangeable aluminum in the root zone. In areas where water of suitable quality is available, supplemental irrigation can prevent the damage to crops that results during dry periods of most years.

The soils in this complex are moderately well suited to pasture. The main limitations are wetness and low fertility. Suitable pasture plants are common bermudagrass, ryegrass, Pensacola bahiagrass, vetch, winter peas, and white clover. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture and soil in good condtion. Fertilizer and lime are needed for optimum growth of grasses and legumes.

The soils in this complex are moderately well suited to the production of loblolly pine, water oak, and sweetgum. The main concern in producing and harvesting timber is wetness. Planting and harvesting operations are limited to dry seasons of the year. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling to eliminate unwanted weeds, brush, and trees. Trees commonly are subject to windthrow during periods when the soil is excessively wet and winds are strong.

The soils in this complex have fair potential as habitat for openland, wetland, and woodland wildlife. They can produce habitat for rabbits, squirrels, and white-tailed deer. Where shallow ponds are constructed or the soils are artifically flooded, these soils can also provide habitat for waterfowl and furbearers.

The soils in this complex are poorly suited to urban and recreational development. The main limitations are wetness, flooding, moderately slow permeability, and low strength. Roads should be designed to offset the limited ability of the soil to support a load. Septic tank absorption fields do not function properly during rainy periods because of the wetness and moderately slow permeability. Drainage is needed if building foundations are constructed.

These soils are in capability subclass IIIw. The Groom soils are in woodland group 3w9, and the Mollicy soils are in 3w7.

Gs—Groom-Mollicy complex, occasionally flooded. This complex consists of poorly drained Groom soils and somewhat poorly drained Mollicy soils. These soils are on low stream terraces along the Ouachita River. They are subject to flooding by backwaters of the Ouachita River. The landscape is undulating. The Groom soils are in broad, level areas, and the Mollicy soils are on low ridges and knolls. The Groom soils make up about 70 percent of the complex, and the Mollicy soils about 20 percent. The Groom soils are on long, smooth slopes that range from 0 to 1 percent. The Mollicy soils are on short, choppy slopes that range from 0 to 5 percent. Areas of these soils are so intermingled that mapping them separately was not practical at the scale selected. Areas of this complex range from about 40 to 1,800 acres.

Typically, the Groom soils have a surface layer of dark grayish brown, very strongly acid silt loam about 4 inches thick. The subsoil extends to a depth of about 65 inches. It is grayish brown, mottled, extremely acid silt loam in the upper part; yellowish brown, mottled, extremely acid silt loam in the middle part; and grayish brown and light brownish gray, mottled, extremely acid silty clay loam in the lower part.

The Groom soils have low fertility. They have high levels of exchangeable aluminum in the root zone that are potentially toxic to most crops. Water and air move through these soils at a moderately slow rate. Water runs off the surface at a slow rate and stands in low places for long periods after heavy rains. A seasonal high water table fluctuates between the surface and a depth of about 1 foot during November through July. The surface layer remains wet for long periods after heavy rains. These soils are subject to long periods of flooding during November through July. Flooding between June 1 and November 30 occurs less often than 2 years out of 5. Plants are damaged by lack of water during dry periods in summer and fall of most years. High levels of sodium are between depths of 40 and 64 inches.

Typically, the Mollicy soils have a surface layer of brown, very strongly acid loam about 3 inches thick. The subsoil, to a depth of about 70 inches, is yellowish brown and grayish brown, mottled, extremely acid silt loam and clay loam in the upper part and strong brown and brown, mottled, extremely acid fine sandy loam and loam in the lower part.

The Mollicy soils are low in fertility. They have high levels of exchangeable aluminum in the root zone that are potentially toxic to most crops. Water and air move through these soils at a moderately slow rate. Water runs off the surface at a slow to medium rate. A seasonal high water table fluctuates between depths of about 1 1/2 and 3 feet during November through June. These soils are subject to long periods of flooding during November through June. Plants are damaged by lack of water during dry periods in summer and fall of most years.

Included with this unit in mapping are a few small areas of Haggerty, Litro, Perry, and Wrightsville soils. These areas make up about 10 percent of the unit. The Haggerty soils are in lower positions and contain more sand than do the Groom and Mollicy soils. The Litro and Perry soils are in lower positions and are clayey throughout. The Wrightsville soils are in higher positions and have a clayey subsoil.

Most areas of this map unit are in woodland owned by timber companies. A small acreage is used for pasture.

The soils in this unit are poorly suited to cultivated crops. They are limited mainly by high levels of exchangeable aluminum in the root zone, low fertility, wetness, and occasional flooding. The main crops are rice and small grain. Returning all crop residue to the soil and using a cropping system that includes grasses and legumes help to maintain fertility and tilth. A drainage system is needed for most crops. Crops respond to fertilization and liming programs designed to improve the fertility and overcome the potentially toxic effects of the aluminum in the root zone.

The soils in this complex are moderately well suited to pasture. The main limitations are wetness, flooding, and low fertility. Suitable pasture plants are common bermudagrass, ryegrass, Pensacola bahiagrass, vetch, winter peas, and white clover. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture and soil in good condition. During flood periods, cattle should be moved to adjacent protected areas or to pasture at higher elevations.

The soils in this complex are moderately well suited to the production of loblolly pine, water oak, and sweetgum. The main limitations for producing and harvesting timber are wetness and occasional flooding. Reforestation, after harvesting, must be carefully managed to reduce competition from undesirable understory plants. Trees should be water tolerant, and they should be planted or harvested during dry periods. Trees commonly are subject to windthrow during periods when the soils are excessively wet and winds are strong.

The soils in this complex have fair potential as habitat for woodland, openland, and wetland wildlife. They can produce habitat for rabbits, squirrels, white-tailed deer, raccoons, and waterfowl.

The soils in this unit are poorly suited to urban and recreational development. The main limitations are flooding, wetness, moderately slow permeability, and low strength. Large flood-control structures are needed to control flooding. Roads should be designed to offset the limited ability of these soils to support a load.

These soils are in capability subclass IVw. The Groom soils are in woodland group 3w9, and the Mollicy soils are in 3w7.

Gu—Guyton silt loam. This level, poorly drained soil is on broad flats and in depressional areas on terrace uplands. Areas range from about 20 to 800 acres. Slopes are less than 1 percent.

Typically, the surface layer is brown, very strongly acid silt loam about 6 inches thick. The subsurface layer, about 17 inches thick, is light brownish gray, mottled, very strongly acid silt loam. The subsoil extends to a depth of about 60 inches. It is grayish brown, mottled, strongly acid silt loam in the upper part; grayish brown, mottled, strongly acid silty clay loam in the middle part;

and light brownish gray, mottled, strongly acid silt loam in the lower part.

Included with this soil in mapping are a few small areas of Bussy, Frizzell, Libuse, and Tillou soils. These areas make up about 20 percent of the unit. The Bussy and Libuse soils are on higher positions and have a fragipan. The Frizzell and Tillou soils are in similar positions and have a browner subsoil.

This soil has low fertility. It has high levels of exchangeable aluminum in the root zone that are potentially toxic to most crops. Water and air move through this soil at a slow rate. Water runs off the surface at a slow to very slow rate. A seasonal high water table fluctuates between the surface and a depth of 1 1/2 feet during December through May. Plants are damaged by lack of water during dry periods in summer and fall of most years.

Most areas of this soil are in woodland. A small acreage is used for crops and pasture.

This soil is moderately well suited to cultivated crops. The main limitations are wetness, high levels of exchangeable aluminum in the root zone, and low fertility. Soybeans, rice, and small grain are the main crops. A drainage system is needed for most cultivated crops. Most crops respond to fertilization and liming programs designed to improve the fertility and overcome the potentially toxic effect of the exchangeable aluminum in the root zone. In areas where water of suitable quality is available, supplemental irrigation can prevent the damage to crops that results during dry periods of most years.

This soil is moderately well suited to pasture. The main limitations are wetness and low natural fertility. Suitable pasture plants are common bermudagrass, Pensacola bahiagrass, white clover, winter peas, and vetch. Wetness limits the choice of plants and the period of grazing. Grazing when the soil is wet results in compaction of the surface layer and damage to the plant cover. Periodic mowing and clipping helps to maintain uniform growth, discourages selective grazing, and reduces clumpy growth. Pasture grasses respond well to additions of fertilizer, and legumes respond to additions of lime.

This soil is well suited to the production of loblolly pine, slash pine, sweetgum, southern red oak, and water oak (fig. 2). Wetness limits the use of equipment. Trees should be water tolerant, and they should be planted or harvested during dry periods. Conventional methods of harvesting timber generally are suitable, but the soil may be compacted if it is wet and heavy equipment is used.

This soil has good potential as habitat for wetland wildlife and fair potential for openland and woodland wildlife. Habitat for wildlife is easily improved, maintained, or created. There are few soil limitations affecting management or development of habitat. Management that enhances the growth of oaks and other mast-producing trees improves the habitat for white-tailed deer and squirrels. Habitat for waterfowl and furbearers can be created by constructing shallow ponds to provide open water areas.

This soil is poorly suited to urban and recreational development. Drainage is needed if roads and building foundations are constructed. Septic tank absorption fields do not function properly during rainy periods because of wetness and slow permeability. Low strength is a limitation where this soil is used for local roads and streets.

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

Gy—Guyton-Cascilla complex, frequently flooded. This complex consists of level, poorly drained Guyton soils and nearly level, well drained Cascilla soils. These soils are on narrow bottom lands of streams that drain terrace uplands and are frequently flooded. The Guyton soils are on flat and concave positions, and the Cascilla soils are on low, narrow ridges that are 1 to 3 feet high and 20 to 60 feet wide. The Guyton soils makes up about 70 percent of the complex, and the Cascilla soils about 20 percent. Areas of these soils are so intermingled that mapping them separately was not practical at the scale selected. Areas of this complex range 50 to 600 acres. The slopes are dominantly less than 1 percent.

Typically, the Guyton soils have a dark grayish brown, strongly acid, silt loam surface layer about 8 inches thick. The subsurface layer is light brownish gray, very strongly acid silt loam about 13 inches thick. The subsoil extends to a depth of about 60 inches. It is grayish brown, mottled, very strongly acid silt loam in the upper part; grayish brown, mottled, very strongly acid silty clay loam in the middle part; and light brownish gray, mottled, very strongly acid silt loam in the lower part.

The Guyton soils have low fertility. High levels of exchangeable aluminum in the root zone are potentially toxic to most crops. Water and air move through these soils at a slow rate. Water runs off the surface at a slow rate and stands in low places for long periods after heavy rains. A seasonal high water table fluctuates between the surface and a depth of 1 1/2 feet during December through May. Very brief to long periods of flooding, to depths of 1 to 5 feet, occur mainly during the winter and spring. Flooding can occur, however, during any season. It occurs between June 1 and November 30 more often than 2 years out of 5. Plants are damaged by lack of water during dry periods in summer and fall of most years.

Typically, the Cascilla soils have a surface layer of dark brown, very strongly acid silt loam about 7 inches thick. The subsoil, to a depth of about 60 inches, is dark yellowish brown, very strongly acid silt loam in the upper part; dark brown, very strongly acid silt loam in the middle part; and dark yellowish brown, mottled, very strongly acid silt loam in the lower part.

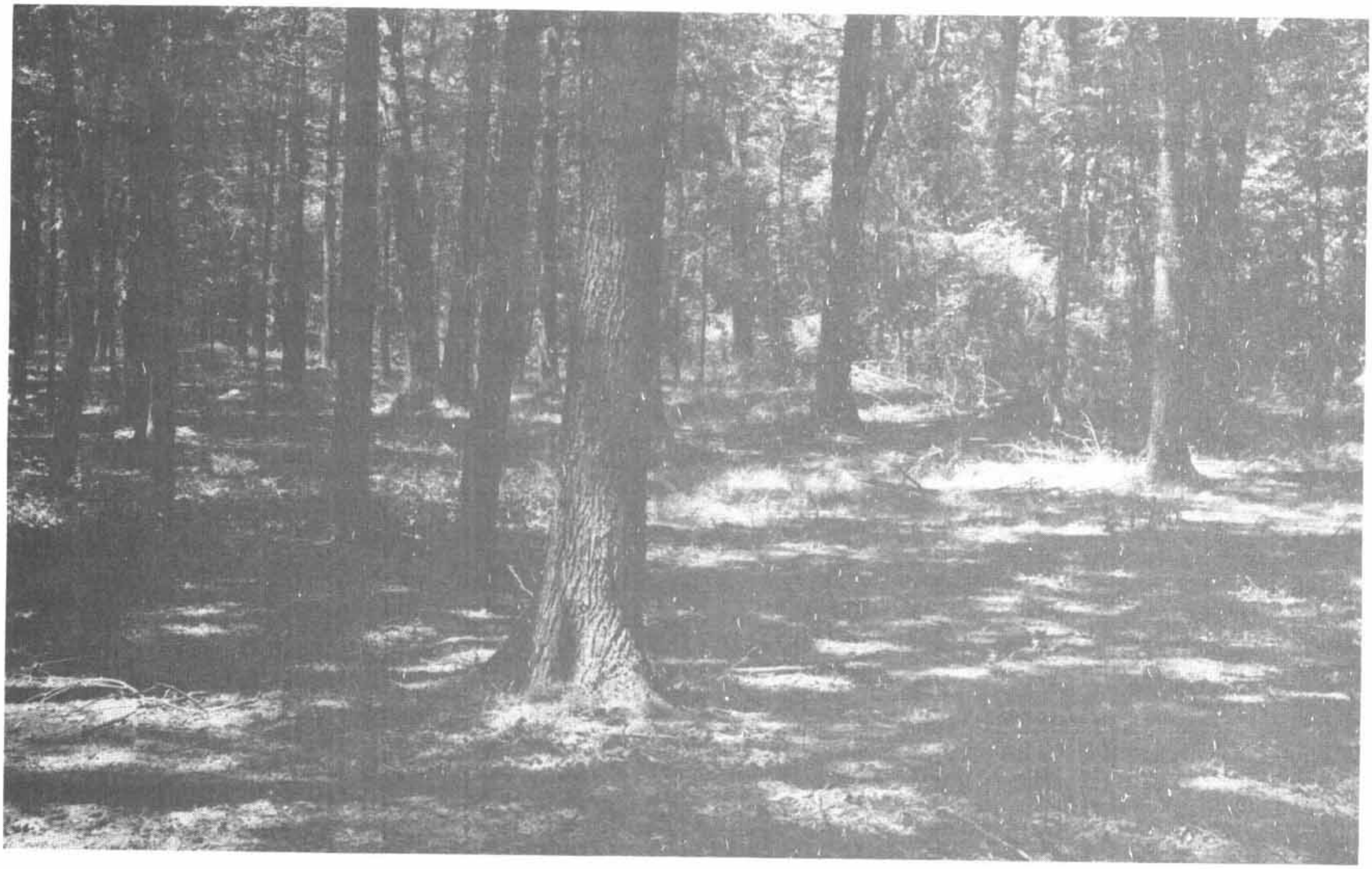


Figure 2.—Dense stand of southern hardwoods on Guyton silt loam.

The Cascilla soils have low fertility. High levels of exchangeable aluminum in the root zone are potentially toxic to most crops. Water and air move through these soils at a moderate rate. Water runs off the surface at a medium rate. These soils are subject to very brief to long periods of flooding during December to April. Floodwaters typically range in depth from 1 foot to 3 feet. Plants are damaged by lack of water during dry periods in summer and fall of most years.

Included with these soils are a few small areas of Frizzell, Perry, Portland, and Tillou soils. These areas make up about 10 percent of the unit. The Frizzell and Tillou soils are in higher positions than the Guyton and Cascilla soils. Frizzell and Tillou soils both have a subsoil that is browner in the upper part than the Guyton soils. They both have a more strongly developed subsoil than the Cascilla soils. The Perry and Portland soils are in positions similar to those of the Guyton soils and are more clayey throughout. Included on some of the higher positions are a few small areas of Guyton and Cascilla soils that are not subject to flooding.

Most areas of this complex are in woodland. A small acreage is used for pasture.

The soils in this unit are moderately well suited to the production of loblolly pine and sweetgum. The main concerns in producing and harvesting timber are wetness and frequent flooding. Wetness limits the use of equipment. Trees should be water tolerant, and they should be planted and harvested during dry periods. Trees commonly are subject to windthrow during periods when these soils are excessively wet and winds are strong.

The soils in this unit are poorly suited to pasture. The main limitations are low fertility, wetness, and frequent flooding. Establishment of improved pastures can be difficult because of frequent flooding. Grasses and legumes that can tolerate overflow should be selected. Common bermudagrass, Pensacola bahiagrass, vetch, and white clover can tolerate some flooding. Native grasses are also suitable. Grazing when the soil is wet results in compaction of the surface layer and damage to the plant cover. During flood periods, cattle should be moved to adjacent protected areas or to pastures at higher elevations. Generally, it is not practical to apply high rates of fertilizer or lime because of the hazard of frequent overflow.

The soils in this complex have fair potential as habitat for woodland wildlife and have good potential as habitat for wetland wildlife. Management that enhances the growth of oak and other mast-producing trees can improve the habitat for squirrels and white-tailed deer. Shallow ponds can be constructed to provide open water areas for waterfowl and furbearers.

The soils in this complex are not suited to cultivated crops or to urban or recreational development. The hazard of flooding is too severe for these uses.

These soils in this complex are in capability subclass Vw. The Guyton soils are in woodland group 2w9, and the Cascilla soils are in 1w7.

Ha—Haggerty loamy fine sand. This level, somewhat poorly drained soil is in areas along the edge of the flood plain of the Ouachita River that are former beaches of relict lakes. An earthen levee protects this soil from most overflows from the Ouachita River. Areas are either long and narrow or oval, and they range in size from 20 to 750 acres. Slopes are dominantly less than 1 percent.

Typically, the surface layer is pale brown, mottled, very strongly acid loamy fine sand about 9 inches thick. The subsoil, to a depth of about 30 inches, is light brownish gray and yellowish brown, mottled, very strongly acid and extremely acid fine sandy loam. The subsoil, between depths of 30 and 40 inches, is light brownish gray, mottled, extremely acid loamy fine sand. The underlying material, to a depth of about 60 inches, is light gray, mottled, very strongly acid sand.

Included with this soil in mapping are a few small areas of Groom, Litro, Mollicy, and Perry soils. These areas make up about 10 percent of the unit. Groom and Mollicy soils are in slightly higher positions and contain more clay in the subsoil. The Litro and Perry soils are in lower positions and contain more clay throughout.

This Haggerty soil has low fertility. It has high levels of exchangeable aluminum in the root zone that are potentially toxic to most crops. Water and air move through this soil at a moderately rapid rate. Water runs off the surface at a very slow rate. A seasonal high water table fluctuates between the surface and a depth of about 1 1/2 feet during November through June. Flooding is rare, but it can occur during unusually high flood levels or when levees fail. Plants generally suffer from a lack of water during dry periods in summer and fall of most years. This soil dries quickly after rains.

Most of the acreage is used for cultivated crops. A small acreage is in woodland and native grass pasture (fig. 3).

This soil is poorly suited to cultivated crops. The main limitations are wetness in spring, droughtiness in summer and fall, high levels of exchangeable aluminum in the root zone, and low fertility. The main crops are wheat, soybeans, and rice. This soil is friable and easy to keep in good tilth. It can be worked over a wide range of moisture content. Drainage is needed to allow timely seedbed preparation in the spring. Crop residue left on or near the surface helps to conserve moisture and maintain tilth. Crops respond to fertilization and liming programs designed to improve the fertility and overcome the potentially toxic effects of the exchangeable aluminum in the root zone. In areas where water of suitable quality is available, supplemental irrigation can prevent the damage to crops that results during dry periods of most years.

This soil is moderately well suited to pasture. Suitable pasture plants are common bermudagrass, ryegrass, Pensacola bahiagrass, white clover, vetch, and winter peas. Wetness in spring and droughtiness in summer and fall are the main limitations. Use of proper stocking rates and pasture rotation helps to keep the pasture in good condition. Fertilizer and lime are needed for optimum growth of grasses and legumes.

This soil is moderately well suited to woodland. The surface layer furnishes poor traction when dry, and seedling mortality rates are generally high because of droughtiness. During the winter, wetness limits the use of equipment. Trees suitable for planting are eastern cottonwood and American sycamore.

This soil is poorly suited to urban and recreational development. The main limitations are wetness and flooding. Drainage is needed if roads and building foundations are constructed. Major flood-control structures are needed to protect this soil from flooding.

This soil has fair potential as habitat for openland and woodland wildlife. Habitat for wildlife such as white-tailed deer and squirrels can be improved by using management that enhances the growth of oak and other mast-producing trees. Habitat for openland wildlife can be improved by providing permanently vegetated areas.

This soil is in capability subclass IIw and woodland group 2w6.

He—Haggerty silty clay. This level, somewhat poorly drained soil is in areas that are former beaches of relict lakes. These areas are mainly along the extreme eastern edge of the flood plain of the Ouachita River. Earthen levees protect this soil from most overflows of the Ouachita River. Areas range from about 50 to 500 acres in size. Slopes are dominantly less than 1 percent.

Typically, the surface layer extends to a depth of about 7 inches. It is very dark grayish brown, mottled, very strongly acid silty clay in the upper part and dark grayish brown, mottled, very strongly acid silty clay in the lower part. The subsoil, to a depth of about 60 inches, is light brownish gray and brown, mottled, extremely acid fine sandy loam in the upper part and light brownish gray, mottled, extremely acid loamy fine sand in the lower part.

Figure 3.—Switchgrass and panicum are the main native grasses in this area of Haggerty loamy fine sand.

Included with this soil in mapping are a few small areas of Groom soils in slightly higher positions and Litro and Perry soils in similar positions. These areas make up about 10 percent of the unit. All of the included soils contain more clay in the subsoil than does the Haggerty soil.

This Haggerty soil has low fertility. It has high levels of exchangeable aluminum in the root zone that are potentially toxic to most crops. Water and air move through the surface layer at a slow rate and through the subsoil at a moderately rapid rate. Water runs off the surface at a very slow rate. Flooding is rare, but it can occur during unusually high flood levels and when levees fail. A seasonal high water table fluctuates between the surface and a depth of about 1 1/2 feet during November through June. This soil has a high shrink-swell potential in the surface layer. Plants are damaged by lack of water during dry periods in summer and fall of most years.

Most areas are used for cultivated crops. A small acreage is in woodland.

This Haggerty soil is poorly suited to cultivated crops, mainly wheat, rice, and soybeans. The main limitations are wetness in spring, droughtiness in summer and fall, low fertility, and high levels of exchangeable aluminum. Crops respond to fertilization and liming programs designed to improve the fertility and overcome the potentially toxic effects of the exchangeable aluminum in the root zone. In areas where water of suitable quality is available, supplemental irrigation can prevent the damage to crops that results during dry periods of most years. Drainage is needed to allow early planting of crops in the spring.

This soil is moderately well suited to pasture. The main limitations are wetness during winter and spring, droughtiness during summer and fall, and low fertility. Suitable pasture plants are common bermudagrass, Pensacola bahiagrass, dallisgrass, johnsongrass, white clover, vetch, and winter peas. Fertilizer and lime are needed for optimum growth of grasses and legumes.

This soil is moderately well suited to the production of eastern cottonwood and American sycamore. Wetness during the winter limits the use of equipment. Only trees that can tolerate seasonal wetness should be planted.

This soil has fair potential as habitat for openland and woodland wildlife. The habitat for woodland wildlife can be improved by providing small open areas and using management that enhances the growth of oak and other mast-producing trees. Habitat for openland wildlife can be created or improved by providing vegetated areas for cover and food.

This Haggerty soil is poorly suited to urban and recreational development. It is limited mainly by wetness, flooding, and the clayey surface layer. Drainage is needed for most urban uses. Major flood-control structures are needed to protect this soil from flooding.

This soil is in capability sublcass IIIw and woodland group 2w6.

Hg—Haggerty loamy fine sand, frequently flooded. This level, somewhat poorly drained soil is in areas of a flood plain that are former beaches of relict lakes. These areas are mainly along the eastern edge of the flood plain of the Ouachita River. Areas range from about 20 to 250 acres. Slopes are dominantly less than one percent.

Typically, the surface layer is dark grayish brown and grayish brown, mottled, extremely acid loamy fine sand about 10 inches thick. The subsoil is gray, mottled, extremely acid fine sandy loam in the upper part; light brownish gray, mottled, extremely acid fine sandy loam in the middle part; and light yellowish brown, mottled, extremely acid loamy fine sand in the lower part. The underlying material, to a depth of about 60 inches, is gray, very strongly acid sand.

Included with this soil in mapping are a few small areas of Groom, Litro, Mollicy, and Perry soils. These areas make up about 10 percent of the unit. The Groom and Mollicy soils are in higher positions, and the Litro and Perry soils are in positions similar to those of the Haggerty soil. All of these soils contain more clay in the subsoil than does the Haggerty soil.

This Haggerty soil has low fertility. It contains high levels of exchangeable aluminum that are potentially toxic to most crops. Water and air move through this soil at a moderately rapid rate. Water runs off the surface at a very slow rate. A seasonal high water table fluctuates between the surface and a depth of about 1 1/2 feet during November through June. This soil is subject to very long periods of flooding during November through July. The depth of floodwaters ranges from 5 to 10 feet. Flooding between June 1 and November 30 occurs more often than 2 years out of 5. Plants generally suffer from a lack of water during dry periods in summer and fall of most years.

All areas of this soil are used for the production of hardwood trees. The soil is poorly suited to cultivated crops and pasture and generally unsuited to urban uses because of the hazard of frequent flooding.

This soil is moderately well suited to woodland. Flooding and wetness limit the use of equipment. Trees should be water tolerant, and they should be planted and harvested during dry periods. Suitable trees to plant are eastern cottonwood and American sycamore. Soil droughtiness during the summer lowers the seedling survival rates in areas where understory plants are numerous.

This soil is poorly suited to pasture. Flooding, wetness in winter and spring, droughtiness in summer and fall, and low fertility are the main limitations. Suitable pasture plants are common bermudagrass, Pensacola bahiagrass, dallisgrass, white clover, vetch, and winter peas. During flood periods, cattle should be moved to adjacent protected areas or to pastures at higher elevations. It is generally not practical to apply high amounts of fertilizer and lime because of the frequent flooding.

This soil has fair potential as habitat for woodland wildlife. This habitat can be improved by providing small open areas and using management that enhances the growth of oak and other mast-producing trees.

This soil is not suited to most urban uses and is poorly suited to recreational development. The main hazards and limitations are flooding and wetness.

This soil is in capability subclass Vw and woodland group 2w6.

Hh—Haggerty silty clay, frequently flooded. This level, somewhat poorly drained soil is in areas that are former beaches of relict lakes. These areas are mainly along the eastern edge of the flood plain of the Ouachita River. Areas range from about 30 to 500 acres. Slopes are dominantly less than 1 percent.

Typically, the surface layer is dark gray and gray, mottled, extremely acid silty clay about 12 inches thick. The subsoil, to a depth of about 33 inches, is light gray, mottled, extremely acid fine sandy loam in the upper part and yellowish brown, mottled, extremely acid loamy fine sand in the lower part. The underlying material, to a depth of about 60 inches, is light gray, mottled, extremely acid loamy fine sand.

Included with this soil in mapping are a few small areas of Groom, Litro, and Perry soils. These areas make up about 10 percent of the unit. The Groom soils are at higher positions, and the Litro and Perry soils are in positions similar to those of the Haggerty soil. All of these soils contain more clay in the subsoil than does the Haggerty soil.

This Haggerty soil has low fertility. It contains high levels of exchangeable aluminum that are potentially toxic to most crops. Water and air move through the surface layer at a slow rate and through the subsoil at a moderately rapid rate. Water runs off the surface at a very slow rate. A seasonal high water table fluctuates between the surface and a depth of about 1 1/2 feet during November through June. These soils are subject to very long periods of flooding during November through July. Flooding between June 1 and November 30 occurs more often than 2 years out of 5. Floodwaters typically are 2 to 10 feet deep, but exceed 20 feet in places. This soil dries slowly after heavy rains. It has a high shrink-swell potential in the surface layer.

Most areas are in woodland and are used for timber production and wildlife habitat. Because of frequent flooding, this soil is poorly suited to cultivated crops and pasture and unsuited to urban development.

This soil is moderately well suited to woodland. Frequent flooding and wetness limit the use of equipment. Trees should be water tolerant, and they should be planted or harvested during dry periods. Suitable trees to plant are eastern cottonwood and American sycamore.

This soil has fair potential as habitat for openland and woodland wildlife, such as quail and white-tailed deer. Management that enhances the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels.

This soil is poorly suited to pasture. It is limited mainly by flooding, wetness, and low fertility. Suitable pasture plants are common bermudagrass, Pensacola bahiagrass, dallisgrass, johnsongrass, white clover, vetch, and winter peas. During flood periods, cattle should be moved to protected areas or to pastures at higher elevations.

This soil is poorly suited to recreational development and is generally not suited to urban development. The main hazards and limitations are flooding, wetness, and the clayey surface layer.

This soil is in capability subclass Vw and woodland group 2w6.

Hr—Hebert silt loam. This level, somewhat poorly drained soil is on broad flats and on the backslopes of natural levees bordering Bayou Bartholomew, Bayou Bonne Idee, and other former channels and distributaries of the Arkansas River. Areas range from about 10 to more than 1,000 acres. Slopes are dominantly less than 1 percent.

Typically, the surface layer is brown, neutral silt loam about 6 inches thick. The subsurface layer is light brownish gray, mottled, very strongly acid silt loam about 9 inches thick. The subsoil is reddish gray, mottled, very strongly acid loam in the upper part; reddish brown, mottled, very strongly acid silty clay loam in the middle part; and reddish brown, mottled, strongly acid silt loam in the lower part. The underlying material, to a depth of about 60 inches, is stratified reddish brown, medium acid silty clay loam and silt loam.

Included with this soil in mapping are a few small areas of Mer Rouge, Perry, Portland, Rilla, and Sterlington soils. These areas make up about 15 percent of the unit. The Mer Rouge soils are in similar positions and have a darker surface layer. The Perry and Portland soils are in lower positions and are more clayey throughout. The Rilla and Sterlington soils are at higher positions and have a subsoil that is browner in the upper part.

This Hebert soil has medium natural fertility. It has moderately high levels of exchangeable aluminum in the root zone that are potentially toxic to some crops. Water and air move through this soil at a moderately slow rate. Water runs off the surface at a slow rate. A seasonal high water table fluctuates between depths of 1 1/2 and 3 feet during December through April. This soil has a moderate shrink-swell potential. Plants are damaged by lack of water during dry periods in summer and fall of most years.

Most of the acreage is in crops. A small acreage is used for pasture, woodland, and homesites.

This soil is well suited to cultivated crops. It is limited mainly by wetness, medium fertility, and moderately high levels of exchangeable aluminum in the root zone. Suitable crops are cotton, soybeans, corn, and small grains. This soil is friable and easy to keep in good tilth. It can be worked over a wide range of moisture content. Proper row arrangement, field drains, and grassed outlets are needed to remove excess surface water. Excessive cultivation can result in the formation of a tillage pan. This pan can be broken by deep plowing or chiseling when the soil is dry. Returning crop residue to the soil or regularly adding other organic matter improves fertility, reduces crusting, and increases the water intake rate. Some crops respond to fertilization and liming programs designed to improve the fertility and overcome the potentially toxic effects of the exchangeable aluminum in the root zone.

This soil is well suited to pasture. The main limitation is wetness. Suitable pasture plants are common bermudagrass, Coastal bermudagrass, improved bermudagrass, Pensacola bahiagrass, ryegrass, white clover, red clover, vetch, and winter peas. Using management that maintains optimum vigor and quality of forage plants is a good practice. Grazing when the soil is wet can result in compaction of the surface layer. Periodic mowing and clipping helps to maintain uniform growth, discourages selective grazing, and reduces clumpy growth. Fertilizer and lime are needed for optimum growth of grasses and legumes.

This soil is well suited to woodland. It has high potential for the production of southern hardwoods. Few areas, however, remain in woodland. Wetness limits the use of equipment somewhat. Plant competition delays natural regeneration but does not prevent the eventual development of a fully stocked normal stand of trees.

Among the trees that are suitable for planting are eastern cottonwood and American sycamore.

This soil has good potential as habitat for openland and woodland wildlife and fair potential for wetland wildlife. There are few soil limitations affecting management and development. Habitat for openland wildlife, such as quail, dove, and rabbits, can be improved by providing undisturbed, vegetated areas. Management that enhances the growth of oaks and other mast-producing trees improves the habitat for white-tailed deer and squirrels.

This soil is moderately well suited to urban development. Moderate shrink-swell potential and wetness are limitations if this soil is used for homesites. Low strength is a limitation for local roads and streets, and wetness is the main limitation for most sanitary facilities. Drainage is needed if building foundations are constructed. Homesite development should be done in a way that preserves as many trees as possible. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has a low shrink-swell potential. Septic tank absorption lines do not function properly during rainy periods because of the wetness and moderately slow permeability. Use of sandy backfill for the trench and long absorption lines helps to compensate for the moderately slow permeability.

This soil is moderately well suited to recreational development. The main limitations are wetness and moderately slow permeability.

This soil is in capability subclass IIw and woodland group 2w5.

Ht—Hebert silty clay loam. This level, somewhat poorly drained soil is on broad flats and in depressional areas on the backslopes of natural levees bordering Bayou Bartholomew, Bayou Bonne Idee, and other former channels and distributaries of the Arkansas River. Areas range from about 10 to 300 acres. Slopes are dominantly less than 1 percent.

Typically, the surface layer is dark brown, medium acid silty clay loam about 6 inches thick. The subsoil, to a depth of about 60 inches, is grayish brown, mottled, strongly acid silty clay loam and silt loam in the upper part; reddish brown and brown, mottled, strongly acid silty clay loam in the middle part; and reddish brown, strongly acid silt loam in the lower part.

Included with this soil in mapping are a few small areas of Perry, Portland, and Rilla soils. The Perry and Portland soils are in lower positions and are more clayey throughout. Rilla soils are on higher positions and have a subsoil that is browner in the upper part.

This Hebert soil has medium fertility. It has moderately high levels of exchangeable aluminum in the root zone that are potentially toxic to some crops. Water and air move through this soil at a moderately slow rate. Water runs off the surface at a slow rate. A seasonal high water table fluctuates between depths of about 1 1/2 and 3 feet during December through April. This soil has a moderate shrink-swell potential. Plants are damaged by lack of water during dry periods in summer and fall of most years. The surface layer of this soil is slightly sticky when wet and hard when dry.

Most areas are used for crops. A small acreage is used for pasture and woodland.

This soil is well suited to cultivated crops. It is limited mainly by wetness, medium fertility, and moderately high levels of exchangeable aluminum in the root zone. Soybeans and rice are the main crops. Other suitable crops are cotton, corn, and small grains. This soil becomes cloddy if it is worked when it is too wet or too dry. Proper row arrangement, field drains, and grassed outlets are needed to remove excess surface water. Land grading and smoothing can also help to remove excess water. Flood irrigation is needed if this soil is used for rice. Excessive cultivation can result in the formation of a tillage pan. This pan can be broken by deep plowing or chiseling when the soil is dry. Returning crop residue to the soil or regularly adding other organic matter improves fertility, reduces crusting, and increases the water intake rate. Most crops respond to fertilization and liming programs designed to improve the fertility and overcome the potentially toxic effects of the exchangeable aluminum in the root zone.

This soil is well suited to pasture. Suitable pasture plants are common bermudagrass, Coastal bermudagrass, improved bermudagrass, Pensacola bahiagrass, ryegrass, white clover, red clover, vetch, and winter peas. Management that maintains optimum vigor and quality of forage plants is needed. Periodic mowing and clipping helps to maintain uniform growth, discourages selective grazing, and reduces clumpy growth. Most pasture plants respond well to fertilizer and lime.

This soil is well suited to woodland. It has high potential for the produciton of southern hardwoods. Few areas, however, remain in woodland. Plant competition delays natural regeneration but does not prevent the eventual development of a fully stocked, normal stand of trees. Among the trees that are suitable for planting are eastern cottonwood and American sycamore. Wetness and the sticky consistence of the surface layer limits the use of equipment somewhat.

This soil has good potential as habitat for openland and woodland wildlife and fair potential for wetland wildlife. There are few or no soil limitations affecting management and development. The habitat for openland wildlife, such as doves, quail, and rabbits, can be improved by providing vegetated plots for food and cover. Managing woodland to encourage the growth of oaks and providing open areas to encourage understory growth can improve the habitat for wildlife such as white-tailed deer and squirrels.

This soil is moderately well suited to urban uses. The moderate shrink-swell potential and wetness are limitations if this soil is used for homesites. Drainage is needed if roads and building foundations are constructed. Homesite development should be done in a way that preserves as many trees as possible. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has a low shrink-swell potential. Septic tank absorption fields do not function properly during rainy periods because of wetness and moderately slow permeability. The limitation of moderately slow permeability can be overcome by increasing the size of the absorption field.

This soil is moderately well suited to recreational development. The main limitations are wetness and moderately slow permeability.

This soil is in capability subclass IIw and woodland group 2w5.

HY—Hebert and Perry soils, frequently flooded. This unit consists of somewhat poorly drained Hebert soils and poorly drained Perry soils on flood plains of rivers and bayous. These soils are subject to frequent flooding for brief to very long periods, mainly in the spring. Areas of these soils occur in an irregular pattern on the landscape. Most mapped areas contain both kinds of soil, but some areas contain only one. In mapped areas that contain both, the Hebert soils are on the higher positions, such as long narrow ridges, and the Perry soils are in the lower positions. Areas range from about 40 to 750 acres. Slopes range from 0 to 3 percent.

About 50 percent of most mapped areas is Hebert soils. Typically, the surface layer is brown, strongly acid silt loam about 5 inches thick. The subsurface layer is light brownish gray, mottled, very strongly acid silt loam about 10 inches thick. The subsoil, to a depth of about 45 inches, is grayish brown, mottled, very strongly acid silty clay loam in the upper part; brown, mottled, very strongly acid loam in the middle part; and brown, mottled, very strongly acid silty clay loam in the lower part. The underlying material, to a depth of about 60 inches, is brown, strongly acid silt loam.

The Hebert soils have medium fertility. Water and air move through these soils at a moderately slow rate. These soils have a moderate shrink-swell potential in the subsoil. A seasonal high water table fluctuates between depths of 1 1/2 and 3 feet during December through April. Flooding between June 1 and November 30 occurs more often than 2 years out of 5. Floodwaters typically are 3 to 15 feet deep, but exceed 20 feet in places. Adequate water is available to plants in most years. In places the Hebert soils have a loamy or clayey overwash on the surface and a stratified loamy and clayey subsoil.

About 30 percent of most mapped areas is Perry soils. Typically, the surface layer is dark grayish brown, strongly acid clay about 6 inches thick. The subsoil is gray, mottled, medium acid clay in the upper part and dark reddish brown, moderately alkaline clay in the lower part. The underlying material, to a depth of about 65 inches, is reddish brown, moderately alkaline clay.

The Perry soils have medium fertility. Water and air move through these soils at a very slow rate. These soils have a very high shrink-swell potential. A seasonal high water table fluctuates between the surface and a depth of about 2 feet during December through April. Flooding between June 1 and November 30 occurs more often than 2 years out of 5. Floodwaters typically are 3 to 15 feet deep, but exceed 20 feet in places. Adequate water is available to plants in most years. In places the Perry soils have a loamy overwash on the surface and a stratified loamy and clayey subsoil.

Included with this unit in mapping are a few small areas of soils similar to the Hebert soils, except that they have a sandier subsoil. These areas make up as much as 20 percent of the unit.

Most of the acreage of this unit is in woodland. A small acreage is used for native pasture and cultivated crops.

The soils in this unit are moderately well suited to production of hardwoods. Suitable trees to plant are eastern cottonwood and American sycamore. Wetness and flooding severely limit the use of equipment during the winter and spring. Reforestation, after harvesting, must be carefully managed to reduce competition from undesirable understory plants.

The soils in this unit are poorly suited to improved pasture. Wetness from the frequent flooding and seasonal high water table is the main limitation. The main suitable pasture plant is common bermudagrass. During periods of flooding, cattle should be moved to pastures protected from flooding or pastures at higher elevations. It is generally not practical to apply high rates of fertilizer or lime to pastures because of the hazard of frequent overflow.

The soils in this unit are poorly suited to cultivated crops. Frequent flooding and wetness are the main limitations. Only late-planted crops such as soybeans and grain sorghum can be grown.

The soils in this unit have good to fair potential as habitat for openland and woodland wildlife and fair potential for wetland wildlife. Shallow ponds can be constructed to attract waterfowl. Preserving existing oak trees can improve the habitat for white-tailed deer and squirrels.

The soils in this unit are generally not suited to urban development. The limitations of flooding and wetness are too severe for this use.

The soils in this unit are poorly suited to recreational development. The main limitations are the clayey surface layer of the Perry soils and flooding and wetness in both the Hebert and Perry soils.

The soils in this unit are in capability subclass Vw. The Hebert soils are in woodland group 2w5, and the Perry soils are in 3w6.

Id—Idee-Forestdale complex. This complex consists of somewhat poorly drained Idee soils and poorly drained Forestdale soils. These soils are on the flood plains of Bayou Bonne Idee and other former channels and distributaries of the Arkansas River. The Idee soils are on low ridges, and the Forestdale soils are in swales and level areas between the ridges. The Idee soils make up about 45 percent of the complex, and the Forestdale soils about 40 percent. The Idee soils have slopes of 0 to 3 percent, and the Forestdale soils have slopes of 1 percent or less. Areas of these soils are so intermingled that it was not practical to map them separately at the scale selected. Areas of this complex range from 20 to 650 acres.

Typically, the Idee soils have a surface layer of dark grayish brown, strongly acid silt loam about 5 inches thick. The subsoil, to a depth of about 70 inches, is grayish brown, mottled, strongly acid silty clay loam in the upper part; yellowish brown, mottled, strongly acid silty clay loam in the middle part; and dark brown, medium acid silt loam in the lower part. In places the lower part of the subsoil is very fine sandy loam or loam.

The Idee soils have medium fertility. Water and air move through these soils at a moderately slow rate. Water runs off the surface at a slow rate. A seasonal high water table fluctuates between depths of about 1 1/2 and 3 1/2 feet during January through April. These soils have a moderate shrink-swell potential. Plants are damaged by lack of water during dry periods in summer and fall of most years.

Typically, the Forestdale soils have a surface layer of dark grayish brown, medium acid silty clay loam about 7 inches thick. The subsoil extends to a depth of about 70 inches. It is gray, mottled, medium acid silty clay in the upper part and light brownish gray, mottled, medium acid silty clay loam in the lower part. In places the lower part of the subsoil is slightly acid silt loam.

The Forestdale soils have medium fertility. Water and air move through these soils at a very slow rate. Water runs off the surface at a slow to very slow rate and stands in low places for short periods after heavy rains. Flooding is rare, but it can occur after high-intensity rains of long duration. A seasonal high water table fluctuates between depths of about 1/2 foot and 2 feet during January through April. These soils have a high shrink-swell potential. Plants are damaged by lack of water during dry periods in summer and fall of most years.

Included in mapping are a few small areas of Dexter, Goodwill, and Perry soils. These areas make up about 15 percent of the unit. The Dexter and Goodwill soils are on slightly higher positions than the Idee soils and have a browner subsoil. The Perry soils are in positions similar to those of the Forestdale soils. They contain more clay in the subsoil than do the Forestdale soils, and they crack during dry periods.

Most of the acreage is in crops. A small acreage is used for pasture and homesites.

The soils in this unit are well suited to cultivated crops. They are limited mainly by wetness. The main suitable crops are cotton (fig. 4), soybeans, rice, corn, grain sorghum, wheat, and oats. Wetness is a limitation to most crops, particularly in the Forestdale soil. Land grading and smoothing can improve surface drainage, but in places large volumes of soil would have to be moved. Returning all crop residue to the soil and using a cropping system that includes grasses, legumes, or grass-legume mixtures help to maintain fertility and tilth. Lime is generally needed. Most crops respond well to fertilizer.

The soils in this unit are well suited to pasture. Wetness and medium fertility are the main limitations. Suitable pasture plants are common bermudagrass, improved bermudagrass, Pensacola bahiagrass, johnsongrass, white clover, winter peas, vetch, and red clover. Fertilizer and lime are needed for optimum production of forage. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture and soil in good condition.

The soils in this complex are well suited to woodland, but because they are also suited to cropland most areas have been cleared for crops or pasture. Conventional methods of harvesting timber generally can be used, but their use may be limited during rainy periods, generally from January to April. Plant competition delays natural regeneration but does not prevent the eventual development of a fully stocked stand of trees. Among the trees that are suitable for planting on both Idee and Forestdale soils are eastern cottonwood and sweetgum.

The soils in this complex are poorly suited to urban development. The main limitations are wetness, low strength, as it affects local roads and streets, and high shrink-swell potential. Drainage is needed if roads and building foundations are constructed. Roads should be designed to offset the limited ability of the soil to support a load. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has a low shrink-swell potential. Septic tank absorption fields do not function properly during rainy periods because of wetness in both soils and very slow permeability in the Forestdale soils. Homesites ought to be located on areas of the Idee soils where possible.

The soils in this unit have good to fair potential as habitat for openland, wetland, and woodland wildlife. Providing undisturbed, vegetated areas near cropland improves the habitat for wildlife such as rabbits, dove, and quail. Management of woodland that enhances the growth of oak and other mast-producing trees can improve the habitat for squirrels, white-tailed deer, and

Figure 4.—Cotton in an area of the Idee-Forestdale complex.

wild turkeys. Shallow ponds can be constructed to attract waterfowl and furbearers.

The Idee soils in this unit are moderately well suited to recreational development, and the Forestdale soils are poorly suited. The main limitations are flooding, wetness, and slow permeability.

This complex is in capability subclass IIIw. The Idee soils are in woodland group 2w5, and the Forestdale soils are in 1w5.

Ie—Idee-Goodwill complex. This complex consists of somewhat poorly drained Idee soils and well drained Goodwill soils. Both soils are on flood plains between Bayou Bonne Idee and the Boeuf River. The Idee soils are in broad, level areas and low ridges, and the Goodwill soils are on higher, convex ridges. The Idee soils make up about 50 percent of the complex, and the Goodwill soils about 35 percent. Areas of these soils are so intermingled that it was not practical to map them separately at the scale selected. Slopes range from 0 to 3 percent. Areas range from about 15 to 800 acres.

Typically, the Idee soils have a surface layer of dark grayish brown, very strongly acid silt loam about 6 inches thick. The subsoil, to a depth of about 70 inches, is grayish brown, mottled, very strongly acid to medium acid silt loam and silty clay loam in the upper part; yellowish brown, mottled, medium acid silt loam in the middle part; and dark brown, mottled, slightly acid loam in the lower part. In places the lower part of the subsoil is silt loam.

The Idee soils have medium fertility. Water and air move through these soils at a moderately slow rate. Water runs off the surface at a slow rate. A seasonal high water table fluctuates between depths of about 1 1/2 and 3 1/2 feet during January through April. These soils have a moderate shrink-swell potential. Plants are damaged by lack of water during dry periods in summer and fall of most years.

Typically, the Goodwill soils have a surface layer of brown, very strongly acid silt loam about 5 inches thick. The subsoil extends to a depth of about 72 inches. It is brown, mottled, very strongly acid silt loam and silty clay loam in the upper part; yellowish brown and brown, mottled, very strongly acid loam and fine sandy loam in the middle part; and dark yellowish brown, mottled, very strongly acid fine sandy loam in the lower part.

The Goodwill soils have medium fertility. Water and air move through these soils at a moderate rate. Water runs off the surface at a slow rate. The seasonal high water table is more than 6 feet below the surface. The shrink-swell potential is moderate. Plants are damaged by lack of water during dry periods in summer and fall of most years.

Included with this unit in mapping are a few small areas of Dexter, Forestdale, and Perry soils. The Dexter soils are on the highest ridges and have a redder subsoil than either the Idee or Goodwill soils. The Forestdale and Perry soils are in swales and other low positions and contain more clay in the subsoil than do the Idee and Goodwill soils.

Most areas are in cultivated crops. A small acreage is used for pasture and homesites.

The soils in this unit are well suited to cultivated crops. They are limited mainly by wetness and short, irregular slopes. Soybeans, grain sorghum, cotton, rice, and wheat are the main crops. Land grading and smoothing can improve surface drainage, but in places large volumes of soil would have to be moved. Returning all crop residue to these soils and using a cropping system that includes grasses, legumes, or grass-legume mixtures help to maintain fertility and tilth. Lime is generally needed. Most crops respond well to fertilizer.

The soils in this complex are well suited to pasture. They have few limitations. Suitable pasture plants are improved bermudagrass, common bermudagrass, Pensacola bahiagrass, ryegrass, ball clover, arrowleaf clover, and crimson clover. Fertilizer and lime are needed for optimum growth of grasses and legumes. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture and soil in good condition.

The soils in this complex are well suited to woodland. Few areas, however, remain in woodland. These soils have a high production potential for hardwoods. Suitable trees to plant on both Idee and Goodwill soils are eastern cottonwood and sweetgum. Wetness limits the use of equipment somewhat. Careful management is needed to control competition from undesirable plants.

The soils in this unit have good potential as habitat for openland and woodland wildlife. Small, undisturbed, and vegetated areas should be provided near cropland. Management of woodland that enhances the growth of oak and other mast-producing trees improves the habitat for squirrels, white-tailed deer, and wild turkeys.

The soils in this complex are moderately well suited to urban development. The main limitations are wetness, moderately slow permeability, and moderate shrink-swell potential. Excess water can be removed by using shallow ditches and providing the proper grade for drainage. Buildings and roads can be designed to offset the effects of shrinking and swelling. Where septic tanks are installed, the limitation of moderately slow permeability can be overcome by increasing the size of the absorption field. The Goodwill soils have fewer limitations for homesites than the Idee soils and should be selected for this use where possible.

The soils in this complex are moderately well suited to recreational development. The main limitations are wetness in the Idee soils and slope in the Goodwill soils.

The soils in this complex are in capability subclass IIw. The Idee soils are in woodland group 2w5, and the Goodwill soils are in 2o4.

La—Lafe silt loam. This level, somewhat poorly drained soil is on low stream terraces. Areas are mainly near the footslopes of terrace upland. Slopes are dominantly less than 1 percent.

Typically, the surface layer is grayish brown, medium acid silt loam about 4 inches thick. The subsurface layer is light brownish gray, neutral silt loam about 8 inches thick. The subsoil is brown, mottled, strongly alkaline silt loam in the upper part; yellowish brown, mottled, strongly alkaline silt loam in the middle part; and yellowish brown, mottled, strongly alkaline silty clay loam in the lower part. The underlying material, to a depth of about 70 inches, is a light brownish gray, mottled, strongly alkaline silt loam. In places the subsoil is gray throughout.

Included with this soil in mapping are a few small areas of Frizzell, Guyton, Libuse, and Wrightsville soils. These areas make up about 20 percent of the unit. None of the included soils are so alkaline in the subsoil as the Lafe soil. Frizzell, Guyton, and Wrightsville soils are in positions similar to those of the Lafe soil. The Libuse soils are in higher positions on the terrace uplands.

This Lafe soil has low fertility. Water and air move through this soil at a very slow rate. Plants generally suffer from a lack of water during dry periods in summer and fall of most years. Water runs off the surface at a slow rate. A seasonal high water table fluctuates between the surface and a depth of about 1 foot during December through April. The subsoil generally remains dry even during periods of high rainfall. Concentrations of sodium salts in the subsoil limit root development and the supply of moisture available for plant growth.

Most of the acreage is in woodland. A small acreage is used for pasture and cultivated crops.

This soil is moderately well suited to pasture. The concentration of sodium in the subsoil and low available water capacity limit the growth of pasture plants. Drought- and salt-tolerant species are most suitable for planting. Suitable pasture plants are common bermudagrass, Pensacola bahiagrass, white clover, winter peas, and vetch. Proper grazing practices, weed control, and fertilizer are needed for maximum quality of forage.

The Lafe soil is poorly suited to cultivated crops. It is limited mainly by excessive amounts of sodium in the subsoil, wetness in the spring, and droughtiness in the summer. Most crops commonly grown in the parish cannot be expected to grow well on this soil.

This soil is poorly suited to the production of southern hardwoods. The production potential is low. The main concerns in producing and harvesting timber are the toxic effect of the high concentrations of sodium in the soil, wetness in the winter and spring, and droughtiness in the summer.

This soil has fair potential as habitat for wetland wildlife and poor potential for woodland wildlife. Shallow ponds can be constructed to attract waterfowl and furbearers. Preserving oak and other mast-producing trees in wooded areas helps to attract such wildlife as squirrels and white-tailed deer. In areas where erosion has exposed the subsoil, white-tailed deer can obtain salt by licking on the subsoil materials.

This soil is poorly suited to urban development. The main limitations are wetness and low strength. Drainage is needed if roads and building foundations are constructed. Roads should be designed to offset the limited ability of the soil to support a load.

This soil is poorly suited to recreational development. The main limitations are wetness, excessive sodium in the subsoil, and very slow permeability.

This soil is in capability subclass VIs. It is not assigned to a woodland group.

Lb—Libuse silt loam, 1 to 3 percent slopes. This very gently sloping, moderately well drained soil is on side slopes and convex ridgetops on terrace uplands. Areas range from about 10 to 500 acres.

Typically, the surface layer is dark grayish brown, medium acid silt loam about 4 inches thick. The subsoil, to a depth of about 27 inches, is yellowish brown and strong brown, strongly acid silt loam. Below this, to a depth of about 60 inches, is a fragipan of yellowish brown, mottled, strongly acid silt loam. The next layer, to a depth of about 70 inches, is yellowish brown, mottled, very strongly acid silt loam.

Included with this soil in mapping are a few small areas of Frizzell, Guyton, and Debute soils. These areas make up about 10 percent of the unit. The Frizzell soils are on level areas and do not have a fragipan. The Guyton soils are on the flood plains of narrow creeks and in depressions and do not have a fragipan. The Debute soils are in similar positions and have a redder subsoil. Also included in some mapped areas are small areas of Libuse soils that have slopes of 3 to 5 percent.

This Libuse soil has low fertility. It has high levels of exchangeable aluminum in the root zone that are potentially toxic to most crops. Water and air move through the upper part of this soil at a moderate rate and through the lower part at a slow rate. Water runs off the surface at a medium rate. A seasonal high water table is perched above the fragipan for short periods after heavy rains. Plants are damaged by lack of water during dry periods in summer and fall of most years. This soil has a low shrink-swell potential.

Most areas are in woodland. A small acreage is used for crops, pasture, and homesites.

This soil is moderately well suited to cultivated crops. The main limitations are slope, low fertility, high levels of exchangeable aluminum in the root zone, and droughtiness during the summer months. Soybeans and potatoes are the main crops, but cotton and corn are grown in places. Most crops respond to fertilization and liming programs designed to improve the fertility and overcome the potentially toxic aluminum in the root zone. Crop residues left on or near the surface help to conserve moisture, maintain tilth, and control erosion.

This soil is well suited to pasture. Low fertility is the main limitation for this use. Suitable pasture plants are Coastal bermudagrass, common bermudagrass, improved bermudagrass, Pensacola bahiagrass, ball clover, crimson clover, and arrowleaf clover. Fertilizer and lime are needed for optimum production of forage.

This soil is well suited to the production of loblolly pine and sweetgum. It has few limitations for use and management. Plant competition delays natural regeneration but does not prevent the eventual development of a fully stocked, normal stand of trees. Proper site preparation can control initial plant competition, and spraying can control subsequent growth.

This soil is moderately well suited to urban and recreational development. Wetness, slow permeabiity, moderate shrink-swell potential, and low strength are the main limitations. A seasonal high water table is perched above the fragipan, and drainage should be provided if buildings are constructed. Preserving the existing plant cover during construction helps to control erosion. Establishing and maintaining plant cover can be achieved by properly fertilizing, seeding, mulching, and shaping the slopes. Septic tank absorption fields do not function properly during rainy periods because of the wetness and slow permeability. The limitation of slow permeability can be overcome by increasing the size of the absorption field.

This soil has good potential as habitat for openland and woodland wildlife. Maintaining undisturbed and permanently vegetated areas near cropland can improve the habitat for quail, rabbits, and wild turkeys. Woodland can be managed to preserve oak and other mast-producing trees for use by white-tailed deer and squirrels.

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

Le—Libuse silt loam, 3 to 5 percent slopes. This gently sloping, moderately well drained soil is on side slopes and ridgetops of terrace uplands. Areas range from about 10 to 500 acres.

Typically, the surface layer is dark brown, medium acid silt loam about 8 inches thick. The subsoil, to a depth of about 22 inches, is strong brown, mottled, very strongly acid silty clay loam. The next layer, to a depth of about 60 inches, is a yellowish brown, mottled, strongly acid, silt loam fragipan.

Included with this soil in mapping are a few small areas of Debute, Frizzell, and Guyton soils. These areas make up about 15 percent of the unit. The Debute soils are in positions similar to those of the Libuse soil and have a reddish subsoil. The Frizzell soils are in level areas and do not have a fragipan. The Guyton soils are on the flood plains of narrow creeks and in depressions and do not have a fragipan. Also included in some mapped areas are a few small areas of Libuse soils that have slopes of 5 to 8 percent.

This Libuse soil has low fertility. It has high levels of exchangeable aluminum in the root zone that are potentially toxic to most crops. Water and air move through the upper part of this soil at a moderate rate and through the lower part at a slow rate. Water runs off the surface at a medium rate. A seasonal high water table is perched above the fragipan for short periods after heavy rains. Plants are damaged by lack of water during dry periods in summer and fall of most years. This soil has a low shrink-swell potential.

Most areas are in woodland. A small acreage is used for pasture, homesites, and cultivated crops.

This soil is moderately well suited to cultivated crops. The main limitations are low fertility, high exchangeable aluminum in the root zone, slope, and droughtiness during the summer months. Truck crops and potatoes are the main crops grown. Most crops respond to fertilization and liming programs designed to improve the fertility and overcome the potentially toxic effects of the exchangeable aluminum in the root zone. Crop residue left on or near the surface helps to conserve moisture and control erosion. All tillage should be on the contour or across the slope.

This soil is well suited to pasture. The low fertility and slope are the main limitations. Suitable pasture plants are Coastal bermudagrass, common bermudagrass, improved bermudagrass, Pensacola bahiagrass, ball clover, crimson clover, and arrowleaf clover. Tilling on the contour during seedbed preparation can reduce erosion. Fertilizer and lime are needed for optimum production of forage.

This soil is well suited to the production of loblolly pine and sweetgum. It has few limitations for use and management. Management that minimizes the risk of erosion is essential in harvesting timber. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling to eliminate unwanted weeds, brush, or trees. Mechanical planting of trees on the contour helps to control erosion.

This soil has good potential as habitat for openland and woodland wildlife. Habitat for wildlife such as rabbits, quail, and wild turkeys can be improved by providing permanently vegetated areas. Planting or encouraging the growth of oaks can improve the habitat for white-tailed deer and squirrels.

This soil is moderately well suited to urban development. It has moderate to severe limitations for building sites, local roads and streets, and most sanitary facilities. A seasonal high water table is perched above the fragipan, and drainage should be provided if buildings are constructed. Preserving the existing plant cover during construction helps to control erosion in the steeper areas. Revegetating disturbed areas around construction sites as soon as possible helps to control soil erosion. Septic tank absorption fields do not function properly during rainy periods because of wetness and slow permeability. The limitation of slow permeability can be overcome by increasing the size of the absorption field. Effluent from absorption fields can surface in downslope areas and create a hazard to health.

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

Lo—Litro clay. This level, poorly drained soil is in backswamps on the flood plains of the Quachita River. A levee protects this soil from most flooding by the Ouachita River. Areas are irregular in shape and range from 20 to 2,000 acres. Slopes are dominantly less than 1 percent, but range from 0 to 2 percent.

Typically, the surface layer is dark gray, very strongly acid clay about 4 inches thick. The subsoil is light gray, gray, and light brownish gray, mottled, very strongly to extremely acid clay about 66 inches thick.

Included with this soil in mapping are a few small areas of Groom, Haggerty, and Perry soils. These areas make up about 10 percent of the unit. The Groom and Haggerty soils are in higher positions and contain less clay in the subsoil than does the Litro soil. Perry soils are in similar positions and have reddish underlying materials.

This Litro soil has low fertility. It contains high levels of exchangeable aluminum in the root zone that are potentially toxic to most crops. Water and air move through this soil at a very slow rate. Water runs off the surface at a slow rate and stands in low places for long periods after heavy rains. Flooding is rare, but it can occur during periods of unusually high rainfall. A seasonal high water table fluctuates between the surface and a depth of about 1 foot during November through June. This soil has a high shrink-swell potential. Plants are damaged by lack of water during dry periods in summer and fall of most years.

Areas of this soil are used about equally for cultivated crops and woodland.

This soil is poorly suited to cultivated crops, mainly rice, soybeans, and wheat. It is sticky when wet and hard when dry, and it becomes cloddy if tilled when it is too wet or too dry. A drainage system is needed for most cultivated crops. Proper row arrangement, field ditches, and grassed outlets are needed to remove excess surface water. Land grading and smoothing will improve surface drainage, allow more uniform application of irrigation water, and permit more efficient use of farm equipment. Returning crop residue to the soil or regularly adding other organic matter improves fertility, reduces crusting, and increases the water intake rate. Crops respond to fertilization and liming programs designed to improve the fertility and overcome the potentially toxic effects of the exchangeable aluminum in the root zone.

This soil is moderately well suited to pasture. The main limitations are wetness and the clayey surface layer. Wetness limits the choice of pasture plants and the period of grazing. Suitable pasture plants are tall fescue, common bermudagrass, Pensacola bahiagrass, white clover, red clover, vetch, and winter peas. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture and soil in good condition. Periodic mowing and clipping helps to maintain uniform growth, discourages selective grazing, and reduces clumpy growth. Pasture plants respond to fertilizer and liming programs designed to improve the fertility.

This soil is moderately well suited to woodland. Few acres, however, remain in woods. Suitable trees to plant are sweetgum, green ash, and Nuttall oak. Equipment limitations are a concern unless drainage is provided. Because the clayey soil is sticky when wet, most planting and harvesting equipment can be used only during dry periods.

The potential as habitat for wetland wildlife is good. It is fair for woodland and openland wildlife. Habitat for wetland wildlife can be improved by constructing shallow ponds and planting suitable crops for food. Habitat for woodland wildlife can be improved by planting oak and other mast-producing trees and encouraging the growth of understory plants.

This soil is poorly suited to urban and recreational development. The main limitations are flooding, wetness, very slow permeability, and high shrink-swell potential. Drainage is needed if roads and building foundations are constructed. Adequate levees need to be constructed and maintained to prevent flooding. Roads should be designed to offset the limited ability of the soil to support a load. Septic tank absorption fields do not function properly during rainy periods because of the wetness and very slow permeability.

This soil is in capability subclass IIIw and woodland group 3w9.

Lt—Litro clay, frequently flooded. This level, poorly drained soil is in backswamp areas on the flood plains of the Ouachita River. It is subject to frequent overflow from the Ouachita River. Areas are irregular and range from 20 to 2,000 acres. Slopes are dominantly less than 1 percent, but range from 0 to 2 percent.

Typically, the surface layer is dark gray, very strongly acid clay about 4 inches thick. The subsoil, to a depth of about 60 inches, is gray, mottled, extremely acid clay in the upper part and light brownish gray, mottled, extremely acid clay in the lower part.

Included with this soil in mapping are a few small areas of Groom, Haggerty, Mollicy, and Perry soils. These areas make up about 10 percent of the unit. All of these soils, except the Perry soils, are on slightly higher positions and contain less clay in the subsoil. The Perry soils are in similar positions and have reddish underlying materials.

This Litro soil has low fertility. It has high levels of exchangeable aluminum in the root zone that are potentially toxic to most crops. Water runs off the surface at a slow rate and stands in low places for long periods after heavy rains. This soil is frequently flooded for brief to very long periods. It floods between June 1 and November 30 more frequently than 2 years out of 5. Floodwaters typically are 2 to 10 feet deep, but exceed 15 feet in places. A seasonal high water table fluctuates between the surface and a depth of about 1 foot. This soil has a high shrink-swell potential.

This soil is used almost entirely for the production of hardwood trees.

This soil is moderately well suited to the production of overcup oak, water hickory, baldcypress, and common persimmon. The main limitations are flooding and wetness. Trees should be water tolerant (fig. 5), and they should be planted or harvested during dry periods. Reforestation, after harvesting, must be carefully managed to reduce competition from undesirable understory plants.

This soil is poorly suited to pasture. It is limited mainly by flooding, wetness, and low fertility. Common bermudagrass is the main suitable pasture plant. It is not practical to apply high rates of fertilizer and lime because of frequent overflow. During flood periods, cattle should be moved to pastures at higher elevations.

This soil has good potential as habitat for wetland wildlife and fair potential for woodland wildlife. The habitat for waterfowl and furbearers can be improved by constructing shallow ponds. Management that enhances the growth of oaks and other mast-producing trees can improve the habitat for squirrels and white-tailed deer.

This soil is poorly suited to recreational development and generally not suited to urban development. The main limitations are flooding and wetness.

This soil is in capability subclass Vw and woodland group 4w9.

Me—Mer Rouge silt loam. This level, moderately well drained soil is mainly on broad flats on the flood plains of Bayou Bonne Idee. Areas range from about 10 to 500 acres. Slopes are dominantly less than 1 percent.

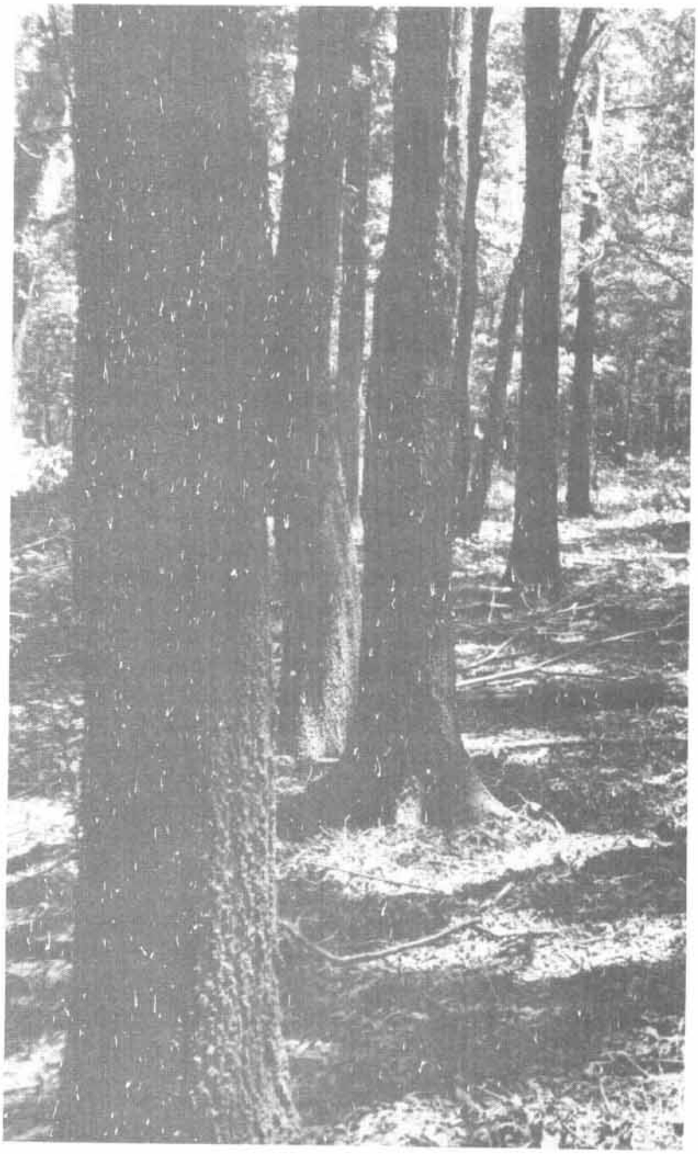


Figure 5.— Water-tolerant hardwoods on Litro clay, frequently flooded.

Typically, the surface layer is very dark grayish brown, neutral silt loam about 7 inches thick. The subsoil extends to a depth of about 64 inches. It is very dark brown, mildly alkaline silt loam in the upper part; dark brown, moderately alkaline silt loam in the middle part; and yellowish brown and brown, moderately alkaline silt loam in the lower part.

Included with this soil in mapping are a few small areas of Gallion, Hebert, Perry, and Rilla soils. These areas make up about 10 percent of the unit. The well drained Gallion and Rilla soils are on higher positions and have a lighter colored surface layer. The somewhat poorly drained Hebert soils are in similar positions and have a lighter colored surface layer. The poorly drained Perry soils are in slightly lower positions and contain more clay throughout.

This Mer Rouge soil has high fertility. Water and air move through this soil at a moderately slow rate. Water runs off the surface at a slow rate. A seasonal high water table fluctuates between depths of 3 and 5 feet during December through April. Adequate water is available to plants in most years. This soil has a moderate shrink-swell potential.

This soil is used mainly for cultivated crops. A small acreage is used for pasture, woodland, and homesites.

This soil is well suited to cultivated crops. It has few limitations for this use. Cotton is the main crop grown, but soybeans, corn, and truck crops are also suitable. This soil is friable and easy to keep in good tilth. It can be worked over a wide range of moisture content. Proper row arrangement, field drains, and grassed outlets can help to remove excess surface water. Excessive cultivation can result in the formation of a tillage pan, but this pan can be broken by deep plowing or chiseling when the soil is dry. Minimum tillage and returning all crop residue to the soil or regularly adding other organic matter improves fertility and helps to maintain the soil tilth and content of organic matter.

This soil is well suited to pasture. It has few limitations. Suitable pasture plants are common bermudagrass, Coastal bermudagrass, improved bermudagrass, Pensacola bahiagrass, white clover, red clover, vetch, and winter peas. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture and soil in good condition. Periodic mowing and clipping helps to maintain uniform growth, discourages selective grazing, and reduces clumpy growth. Fertility generally is sufficient for sustained production of high-quality, nonirrigated pasture.

This soil is well suited to woodland. It has few limitations for this use. Few areas, however, remain in woods. Among the trees that are suitable for planting are eastern cottonwood and American sycamore.

This soil has good potential as habitat for openland and woodland wildlife. Providing small, undisturbed and vegetated areas near cropland can improve the habitat for quail and rabbits. Habitat for woodland wildlife can be created or improved by planting appropriate vegetation or by helping the natural establishment of desirable plants.

This soil is moderately well suited to urban development. Wetness, moderately slow permeaiblity, and moderate shrink-swell potential are limitations if this soil is used for homesites, local roads and streets, and most sanitary facilities. Drainage is needed if roads and building foundations are constructed. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has a low shrink-swell potential. Where septic tanks are installed, the limitation of moderately slow permeability can be overcome by increasing the size of the absorption field.

This soil is moderately well suited to recreational development. The main limitation is moderately slow permeability.

This soil is in capability class I and woodland group 2o4.

Mo—Mer Rouge silty clay loam. This level, moderately well drained soil is on broad flats and in depressional areas on the flood plains of Bayou Bonne Idee. Areas range from about 10 to 80 acres. Slopes are dominantly less than 1 percent.

Typically, the surface layer is about 10 inches thick. It is very dark grayish brown, neutral silty clay loam in the upper part and very dark gray, neutral silty clay loam in the lower part. The subsoil extends to a depth of about 60 inches. It is black, neutral silty clay loam in the upper part; very dark grayish brown, mildly alkaline silty clay loam in the middle part; and dark brown, brown, and dark yellowish brown, mildly alkaline and moderately alkaline silty clay loam in the lower part.

Included with this soil in mapping are a few small areas of Gallion, Hebert, and Perry soils. These areas make up about 15 percent of the unit. The Gallion soils are on higher positions and have a lighter colored surface layer. The Hebert soils are in similar positions and have a lighter colored surface layer. The Perry soils are in lower positions and are more clayey throughout.

This Mer Rouge soil has high fertility. Water and air move through this soil at a moderately slow rate. Water runs off the surface at a slow rate. A seasonal high water table fluctuates between depths of 3 and 5 feet during December through April. The shrink-swell potential is moderate. Adequate water is available to plants in most years.

Most of the acreage is in cultivated crops. A small acreage is in pasture, woodland, and homesites.

This soil is well suited to cultivated crops, mainly cotton, soybeans, corn, rice, and small grains. Wetness is the main limitation. This soil becomes somewhat cloddy if it is worked when it is too wet or too dry. Proper row arrangement, field drains, and grassed outlets are needed to remove excess surface water. Land grading and smoothing will improve surface drainage and permit more efficient use of farm equipment. Flooding irrigation is needed if this soil is used for rice. Excessive cultivation can result in the formation of a tillage pan, but this pan can be broken by deep plowing or chiseling when the soil is dry. Returning crop residue to the soil or regularly adding other organic matter improves fertility, reduces crusting, and increases the water intake rate.

This soil is well suited to pasture. It has few limitations for this use. Suitable pasture plants are common bermudagrass, Coastal bermudagrass, improved bermudagrass, Pensacola bahiagrass, white clover, red clover, vetch, and winter peas. Management is needed that maintains optimum vigor and quality of forage plants. Grazing when the soil is wet results in compaction of the surface layer. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture and soil in good condition. Fertility generally is sufficient for sustained production of high-quality, nonirrigated pasture.

This soil is well suited to woodland. It has few limitations for producing and harvesting timber. Few areas, however, remain in woodland. Among the trees that are suitable for planting are eastern cottonwood and American sycamore.

This soil has good potential as habitat for openland and woodland wildlife. There are few soil limitations for management or development. Vegetation can be managed to provide habitat for wildlife such as quail, dove, raccoons, white-tailed deer, and squirrels.

This soil is moderately well suited to urban development. Wetness, moderately slow permeability, and moderate shrink-swell potential are limitations for homesites, local roads and streets, and most sanitary facilities. Wetness can be reduced by installing drain tile around footings of buildings. In addition, structures to divert runoff are needed if buildings and roads are constructed. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has a low shrink-swell potential. Where septic tanks are installed, the limitation of slow permeability can be overcome by increasing the size of the absorption field.

This soil is moderately well suited to recreational development. The main limitation is moderately slow permeability.

This soil is in capability subclass IIw and woodland group 2o4.

Mr—Mer Rouge-Gallion complex. This complex consists of moderately well drained Mer Rouge soils and well drained Gallion soils. Both soils are on the flood plains of Bayou Bonne Idee and other former channels and distributaries of the Arkansas River. The Mer Rouge soils are in level areas. The Gallion soils are on low ridges and mounds that are less than 1-1/2 feet in height and are 25 to 150 feet in width. The Mer Rouge soils make up about 50 percent of the complex, and the Gallion soils about 35 percent. Areas of these soils are so intermingled that mapping them separately was not practical at the scale selected. Areas of this complex range from about 10 to 400 acres. Slopes range from 0 to 1 percent on the Mer Rouge soil and from 0 to 2 percent on the Gallion soil.

Typically, the Mer Rouge soils have a surface layer of very dark grayish brown, neutral silt loam about 4 inches thick. The subsoil extends to a depth of about 60 inches. It is very dark grayish brown, mildly alkaline silty clay loam in the upper part; yellowish brown, moderately alkaline silt loam in the middle part; and strong brown, moderately alkaline silty clay loam in the lower part.

The Mer Rouge soils have high fertility. Water and air move through these soils at a moderately slow rate. Water runs off the surface at a slow rate. A seasonal high water table fluctuates between depths of about 3 and 5 during December through April. Adequate water is available to plants in most years.

Typically, the Gallion soils have a surface layer of dark grayish brown, neutral silt loam about 8 inches thick. The subsoil is yellowish red, mildly alkaline silt loam in the upper part; strong brown, mildly alkaline silt loam in the middle part; and brown, moderately alkaline silt loam in the lower part. The underlying material, to a depth of about 60 inches, is brown, moderately alkaline silty clay loam.

The Gallion soils have high fertility. Water and air move through this soil at a moderate rate. Water runs off the surface at a slow rate. Plants are damaged by a lack of water during dry periods in some years. The shrink-swell potential is moderate.

Included with this unit in mapping are a few small areas of Hebert, Perry, Portland, Rilla, and Sterlington soils. These areas make up about 15 percent of the unit. The Hebert soils are in lower positions and have a subsoil that is grayer in the upper part than the Mer Rouge and Gallion soils. The Perry and Portland soils are in swales and depressional areas and are clayey throughout. The Rilla and Sterlington soils are on the highest parts of some of the ridges and have a subsoil that is more acid than the Mer Rouge and the Gallion soils.

Most areas of this complex are in cultivated crops. A small acreage is in pasture, woodland, and homesites.

The soils in this complex are well suited to cultivated crops, mainly cotton, soybeans, grain sorghum, and truck crops. They have few limitations. Field drains and grassed outlets help to remove excess surface water from the included areas of the Perry and Portland soils. The soils in this complex are friable and easy to keep in good tilth. They can be worked over a wide range of moisture content. Land grading and smoothing can help to remove excess water and permit more efficient use of farm equipment, but in places large volumes of soil would have to be moved. Crop residue left on or near the surface helps to conserve moisture and maintain tilth.

The soils in this complex are well suited to pasture. They have few limitations. Suitable pasture plants are common bermudagrass, Coastal bermudagrass, improved bermudagrass, Pensacola bahiagrass, white clover, red clover, vetch, and winter peas. Fertility generally is sufficient for sustained production of high-quality, nonirrigated pasture. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture and soil in good condition.

The soils in this complex are well suited to woodland. They have a high production potential. Suitable trees to plant are eastern cottonwood and American sycamore.

The soils in this complex have good potential as habitat for openland and woodland wildlife. Habitat can easily be improved and maintained for wildlife such as white-tailed deer, rabbits, squirrels, dove, and quail.

The soils in this complex are moderately well suited to urban development. They have moderate limitations for building sites, local roads and streets, and most sanitary facilities. The main limitations are wetness, moderate and moderately slow permeaiblity, and moderate shrink-swell potential. Excess water can be removed by using shallow drains and providing the proper grade for drainage. Septic tank absorption fields do not function properly during rainy periods because of the wetness and moderate and moderately slow permeability. Providing drainage and increasing the size of the absorption field can help to overcome these limitations.

The soils in this complex are well suited to recreational development. They have few limitations for most uses. If paths and trails are developed, however, erosion is a severe hazard on the more sloping areas of the Gallion soils.

The soils in this complex are in capability class I and woodland group 2o4.

Pc—Perry clay, 0 to 1 percent slopes. This poorly drained, level soil is in backswamp areas on flood plains of the Ouachita River, Bayou Bonne Idee, and other former channels of the Arkansas River. Areas range from about 20 to 1,800 acres. Slopes are dominantly less than 1 percent.

Typically, the surface layer is gray, mottled, medium acid clay about 6 inches thick. The subsoil is gray, mottled, strongly acid and medium acid clay in the upper part and dark reddish brown, mottled, mildly alkaline clay in the lower part. The underlying material, to a depth of about 60 inches, is reddish brown, mottled, mildly alkaline clay.

Included with this soil in mapping are a few small areas of Forestdale, Gallion, Hebert, Mer Rouge, and Portland soils. These areas make up 15 percent of the unit. The Gallion, Hebert, and Mer Rouge soils are on higher positions and are loamy throughout. The Forestdale soils are on slightly higher positions and contain less clay in the subsoil. The somewhat poorly drained Portland soils are on slightly higher positions and are redder throughout.

This Perry soil has medium fertility. Water and air move through this soil at a very slow rate. Water runs off the surface at a slow to very slow rate and stands in low places for long periods after heavy rains. Flooding is rare, but it can occur after unusually heavy rains. A seasonal high water table fluctuates between the surface and a depth of 2 feet during December through April. This soil has a very high shrink-swell potential. Plants are damaged by lack of water during dry periods in summer and fall of some years.

Most of the acreage is in cultivated crops. A small acreage is in woodland and pasture.

This soil is moderately well suited to cultivated crops, mainly rice (fig. 6), soybeans, and grain sorghum. If this soil is used for nonirrigated crops, the main limitations are wetness and poor tilth. This soil can be worked only within a narrow range of moisture content. It is sticky when wet and hard when dry, and it becomes cloddy if it is worked when it is too wet or too dry. A drainage system is needed for most cultivated crops. Proper row arrangement, field drains, and vegetated outlets are needed to remove excess surface water. Flood irrigation is needed if rice is grown. Pipe or other drop structures should be installed in drainage channels to control the water level in ricefields and to prevent excessive erosion of drainage channels. Minimum tillage and returning all crop residue to the soil or regularly adding other organic matter improves fertility and helps to maintain soil tilth and content of organic matter.

This soil is well suited to pasture. The main limitations are wetness and the clayey texture. Grazing when the soil is wet results in compaction of the surface layer. Suitable pasture plants are tall fescue, common bermudagrass, improved bermudagrass, Coastal bermudagrass, dallisgrass, Pensacola bahiagrass, white clover, vetch, and winter peas. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture and soil in good condition. Periodic mowing and clipping helps to maintain uniform growth, discourages selective grazing, and reduces clumpy growth. Most pasture plants respond well to fertilizer.

This soil is moderately well suited to woodland. It has high potential for the production of southern hardwoods. Wetness and stickiness of the soil surface, however, severely limit the use of equipment. Plant competition delays natural regeneration but does not prevent the eventual development of a fully stocked, normal stand of trees. Only trees that can tolerate seasonal wetness should be planted. Among the trees that are suitable for planting are eastern cottonwood and sweetgum.

This soil has good potential as habitat for woodland and wetland wildlife and fair potential for openland wildlife. Management that enhances the growth of oaks and other mast-producing trees can improve the habitat for white-tailed deer and squirrels. Shallow ponds can be constructed to improve the habitat for waterfowl and furbearers. Habitat for openland wildlife such as rabbits, quail, and doves can be improved by creating small,

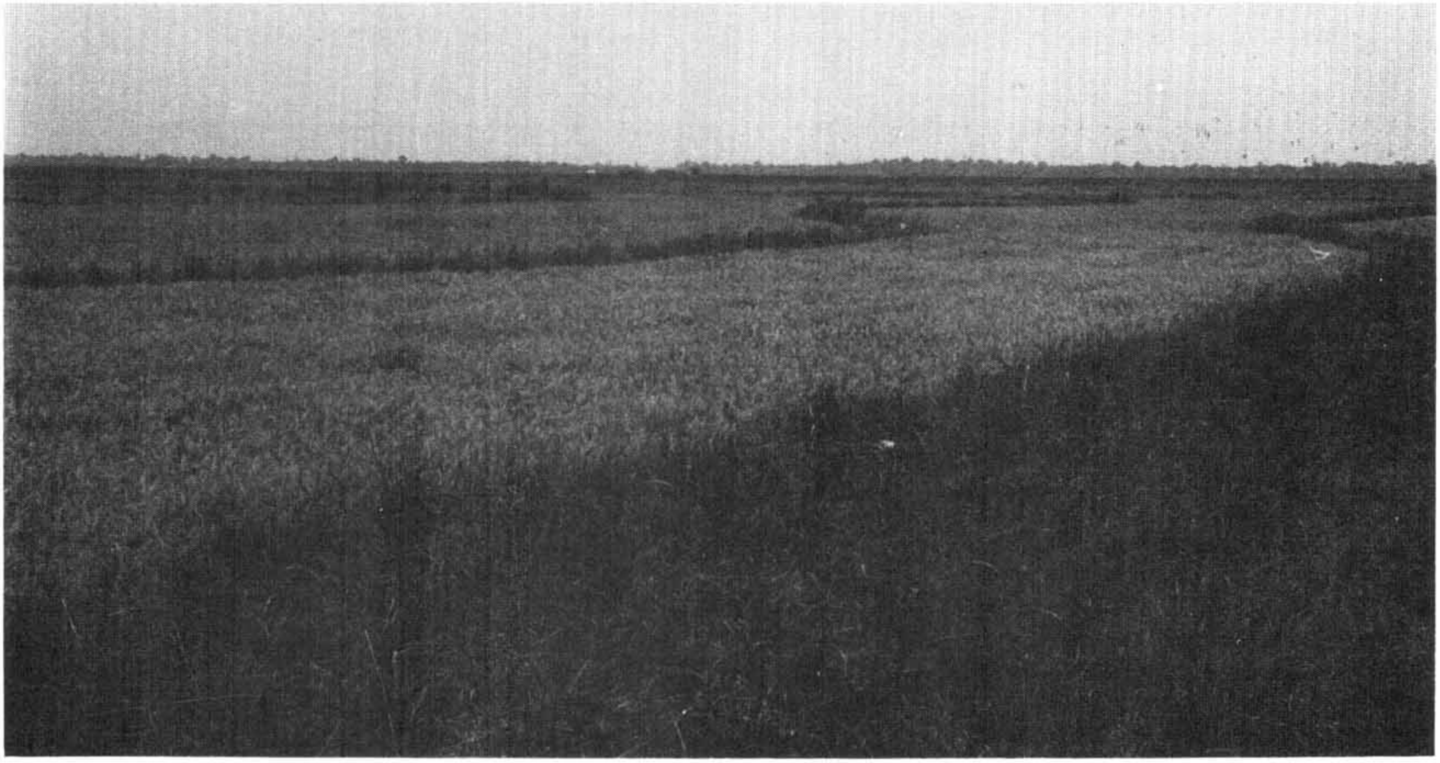


Figure 6.—Rice is one of the main crops grown on Perry clay, 0 to 1 percent slopes.

undisturbed areas of appropriate vegetation near cropland.

This soil is poorly suited to urban development. The main limitations are wetness, very high shrink-swell potential, low strength as it affects local roads and streets, flooding, and very slow permeability. Drainage is needed if roads and building foundations are constructed. Excess water can be removed by using shallow drains and providing the proper grade for drainage. If buildings are constructed on this soil, properly designing foundations and footings and diverting runoff away from buildings help to prevent structural damage as a result of shrinking and swelling. Septic tank absorption fields do not function properly during rainy periods because of the wetness and very slow permeability.

This soil is poorly suited to recreational development. The main limitations are wetness, flooding, very slow permeability, and the clayey surface layer.

This soil is in capability subclass IIIw and woodland group 2w6.

Pe—Perry clay, gently undulating. This poorly drained, gently undulating soil is on flood plains of the Ouachita River, Bayou Bonnie Idee, and other former channels of the Arkansas River. The landscape consists of many, low, parallel ridges and shallow swales. The convex ridges range in width from 100 to 300 feet. The concave swales are mostly less than 200 feet wide. Areas range from about 15 to 150 acres. Slopes range from 0 to 3 percent.

Typically, the surface layer is dark grayish brown, medium acid clay about 5 inches thick. The subsoil is grayish brown, mottled, medium acid clay in the upper part and grayish brown, mottled, slightly acid clay in the lower part. The underlying material, to a depth of about 60 inches, is reddish brown, mottled, neutral clay.

Included with this soil in mapping are a few small areas of Forestdale, Hebert, Portland, and Rilla soils. These areas make up about 20 percent of the unit. The Forestdale soils are on slightly higher positions and contain less clay in the subsoil. The somewhat poorly drained Portland soils are on slightly higher positions and are redder throughout. The Hebert and Rilla soils are on higher positions and are loamy throughout.

This Perry soil has medium fertility. Water and air move through this soil at a very slow rate. Water runs off the surface at a slow rate. Flooding is rare, but it can occur after unusually heavy rains. A seasonal high water table fluctuates between the surface and a depth of 2 feet during December through April. This soil has a very high shrink-swell potential. Plants generally suffer some years from a lack of water during dry periods in summer and fall.

Most areas are used for cultivated crops and pasture. A small acreage is in woodland.

This soil is moderately well suited to cultivated crops. The main limitations are wetness, very slow permeability, and slope. Cultivation is difficult on this soil because of the short, irregular slopes and narrow swales. The main suitable crops are soybeans and small grains. This soil is difficult to keep in good tilth. It can be worked only within a narrow range of moisture content. It becomes cloddy if it is worked when it is too wet or too dry. Proper row arrangement, field drains, and grassed outlets are needed to remove excess surface water. Land grading and smoothing also will improve surface drainage and permit more efficient use of farm equipment. Minimum tillage and returning all crop residue to the soil or regularly adding other organic matter improves fertility and helps to maintain soil tilth and content of organic matter.

This soil is well suited to pasture. The main limitation is wetness. Suitable pasture plants are tall fescue, common bermudagrass, improved bermudagrass, Coastal bermudagrass, Pensacola bahiagrass, white clover, red clover, vetch, and winter peas. Periodic mowing and clipping helps to maintain uniform growth, discourages selective grazing, and reduces clumpy growth. Proper grazing practices, weed control, and fertilizer are needed to maintain the best forage.

This soil is moderately well suited to woodland. It has high potential for the production of southern hardwoods. Wetness and the clayey texture of the surface layer, however, limit the use of equipment. Plant competition delays natural regeneration but does not prevent the eventual development of a fully stocked, normal stand of trees. Trees should be water tolerant, and they should be planted or harvested during dry periods. Among the trees that are suitable for planting are eastern cottonwood and sweetgum. Trees commonly are subject to windthrow when the soil is excessively wet and winds are strong.

This soil has good potential as habitat for woodland and wetland wildlife and fair potential for openland wildlife. Habitat for white-tailed deer, squirrels, and turkey can be improved by encouraging the growth of oaks and desirable understory vegetation. Constructing shallow ponds can improve the habitat for waterfowl and furbearers. Creating undisturbed, vegetated areas around the edges of cropland can improve the habitat for quail, doves, and rabbits.

This soil is poorly suited to urban development. It has severe limitations for building sites, local roads and streets, and most sanitary facilities. The main limitations are wetness, flooding, very high shrink-swell potential, low strength as it affects local roads and streets, and very slow permeability. Drainage is needed if roads and building foundations are constructed. Revegetating disturbed areas around construction sites as soon as possible helps to control soil erosion. If buildings are constructed on this soil, properly designing foundations and footings and diverting runoff away from buildings help to prevent structural damage as a result of shrinking and swelling. Septic tank absorption fields do not function properly during rainy periods because of the wetness and very slow permeability. Roads should be designed to offset the limited ability of the soil to support a load.

This soil is poorly suited to recreational development. The main limitations are wetness, flooding, very slow permeability, and the clayey surface layer.

This soil is in capability subclass IIIw and woodland group 2w6.

Pg—Perry clay, occasionally flooded. This level, poorly drained soil is in backswamp areas on flood plains of the Ouachita River, Bayou Bartholomew, and other former channels of the Arkansas River. Areas range from about 20 to 400 acres. This soil is subject to occasional flooding. Slopes are dominantly less than 1 percent.

Typically, the surface layer is dark grayish brown, mottled, strongly acid clay about 4 inches thick. The subsoil, to a depth of about 60 inches, is gray, mottled, strongly acid clay in the upper part and reddish brown, mottled, mildly alkaline clay in the lower part. In some places, the surface layer is silty clay or silty clay loam. In other places, concretions of calcium carbonate are in the lower part of the subsoil.

Included with this soil in mapping are a few small areas of Litro and Portland soils. These areas make up about 15 percent of the unit. The Litro soils are on similar positions and have a more acid subsoil. The Portland soils are in slightly higher positions and have a redder subsoil.

This Perry soil has medium fertility. Water and air move through this soil at a very slow rate. Water runs off the surface at a very slow rate and stands in low places for long periods after heavy rains. In winter and spring, these soils are subject to periods of flooding that range from brief to very long. Flooding between June 1 and November 30 occurs less often than 2 years out of 5. A seasonal high water table fluctuates between the surface and a depth of about 2 feet during December through April. This soil has a very high shrink-swell potential. Adequate water is available to plants in most years.

Most areas are in woodland. A small acreage is used for cultivated crops and pasture.

The Perry soil is moderately well suited to woodland. It has a high potential for the production of water oak, water hickory, eastern cottonwood, and sweetgum. The main concerns in producing and harvesting timber are wetness and the clayey texture of the surface layer. Competing vegetation can be controlled by proper site preparation and by spraying, cutting, or girdling to eliminate unwanted weeds, brush, or trees. Only trees that can tolerate seasonal wetness should be planted. Because the clayey soil is sticky when wet, most planting and harvesting equipment can be used only during dry periods. Trees commonly are subject to windthrow when the soil is excessively wet and winds are strong.

This soil is poorly suited to cultivated crops. The main limitations are wetness, poor tilth, very slow permeability, and flooding. Soybeans and grain sorghum are the main crops. Cotton, corn, and rice are grown in places. This soil is sticky when wet and hard when dry, and it becomes cloddy if tilled when it is too wet or too dry. Proper row arrangement, field ditches, and grassed outlets are needed to remove excess surface water. Tilth and fertility can be improved by using minimum tillage and returning crop residue to the soil.

This soil is moderately well suited to pasture. The main limitations are wetness, the very slow permeability, and flooding. Wetness limits the choice of plants and the period of grazing. The main suitable pasture plants are common bermudagrass, winter peas, vetch, and adapted native grasses. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture and soil in good condition. During flood periods, cattle should be moved to adjacent protected areas or to pastures at higher elevations.

This soil is poorly suited to urban development. The main limitations are flooding, wetness, and very high shrink-swell potential. Major flood-control structures, along with extensive local drainage systems, are needed to protect this soil from flooding.

This soil has fair potential as habitat for openland, woodland, and wetland wildlife. Habitat can be created or improved by planting appropriate vegetation, by maintaining existing plant cover, or by helping the natural establishment of desirable plants.

This soil is in capability subclass IVw and woodland group 2w6.

Pn—Portland silt loam. This nearly level, somewhat poorly drained soil is on slight rises on flood plains of the Ouachita River, Bayou Bonne Idee, and other former channels of the Arkansas River. Areas range from about 10 to 200 acres. Slopes range from 0 to 2 percent.

Typically, the surface layer is dark brown, very strongly acid silt loam about 4 inches thick. The subsoil is brown, mottled, very strongly acid clay in the upper part and reddish brown, mottled, medium acid clay in the lower part. The underlying material, to a depth of about 46 inches, is reddish brown, mottled, yellowish red, mildly alkaline clay. The next layer, to a depth of about 60 inches, is reddish brown, mottled, mildly alkaline silty clay loam.

Included with this soil in mapping are a few small areas of Hebert, Perry, Rilla, and Sterlington soils. Also included are a few small areas of Portland clay soils. These included areas make up about 15 percent of the unit. The Hebert, Rilla, and Sterlington soils are on higher positions and are loamy throughout. The Perry soils are on lower positions and have a grayer subsoil.

This Portland soil has medium fertility. Water and air move through this soil at a very slow rate. Water runs off the surface at a slow to very slow rate. A seasonal high water table fluctuates between the surface and a depth of 1 foot during December through May. Flooding is rare, but it can occur during periods of unusually heavy rainfall. This soil has a high shrink-swell potential in the subsoil. Plants are damaged by lack of water during dry periods in summer and fall of some years.

Most areas are used for cultivated crops. A small acreage is in pasture and woodland.

This soil is moderately well suited to cultivated crops. The main limitations are wetness and very slow permeability. Rice, soybeans, and grain sorghum are the main crops grown. Proper row arrangement, field drains, and grassed outlets are needed to remove excess surface water. Flood irrigation is needed if rice is grown. Land grading and smoothing will improve surface drainage, allow more uniform application of irrigation water, and permit more efficient use of farm equipment. Pipe or other drop structures should be installed in drainage channels to control the water level in ricefields and to prevent excessive erosion of drainage channels. Returning crop residue to the soil or regularly adding other organic matter improves fertility, reduces crusting, and increases the water intake rate.

This soil is well suited to pasture. The main limitations are wetness and the very slow permeability. Grazing when the soil is wet results in compaction of the surface layer. The main suitable pasture plants are improved bermudagrass, common bermudagrass, dallisgrass, Pensacola bahiagrass, white clover, tall fescue, vetch, and winter peas. Fertilizer and lime are needed for optimum growth of grasses and legumes. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture and soil in good condition.

This soil is well suited to woodland. It has high potential for producing southern hardwoods. Only trees that can tolerate seasonal wetness should be planted. Among the trees that are suitable for planting are green ash, eastern cottonwood, and sweetgum. Conventional methods of harvesting timber generally can be used, but their use may be limited during rainy periods, generally from December to May.

This soil has good potential as habitat for openland, woodland, and wetland wildlife. There are few, if any, soil limitations affecting habitat management or development. Habitat for openland and woodland wildlife can be improved by planting appropriate vegetation or by helping the natural establishment of desirable plants. Habitat for waterfowl can be created by constructing shallow ponds.

This soil is poorly suited to urban development. It has severe limitations for building sites, local roads and streets, and most sanitary facilities. The main limitations are wetness, flooding, low strength as it affects local roads and streets, and high shrink-swell potential. Drainage is needed if roads and building foundations are constructed. Local roads and streets can be designed to offset the limited ability of the soil to support a load. If buildings are constructed on this soil, properly designing foundations and footings and diverting runoff away from buildings help to prevent structural damage caused by shrinking and swelling. Septic tank absorption fields do not function properly during rainy periods because of wetness and very slow permeability. Constructing adequate protection levees and installing an extensive drainage system can help prevent flooding and reduce wetness.

This soil is poorly suited to recreational development. The main limitations are wetness, flooding, and very slow permeability.

This soil is in capability subclass IIIw and woodland group 2w6.

Po—Portland clay. This nearly level, somewhat poorly drained soil is on slight rises on flood plains of the Ouachita River, Bayou Bonne Idee, and other former channels of the Arkansas River. Areas range from about 10 to 200 acres. Slopes range from 0 to 2 percent.

Typically, the surface layer is brown, mottled, medium acid clay about 6 inches thick. The subsoil, to a depth of about 65 inches, is reddish brown, mottled, strongly acid clay in the upper part and reddish brown, mottled clay in the middle and lower parts.

Included with this soil in mapping are a few small areas of Gallion, Hebert, Perry, Rilla, and Sterlington soils. These areas make up about 10 percent of the unit. The Gallion, Hebert, Rilla, and Sterlington soils are on higher positions and are loamy throughout. The Perry soils have a grayer subsoil and are on slightly lower positions.

This Portland soil has medium fertility. Water and air move through this soil at a very slow rate. Water runs off the surface at a slow to very slow rate and stands in low places for long periods after heavy rains. A seasonal high water table fluctuates between the surface and a depth of 1 foot during December through May. Flooding is rare, but it can occur during periods of unusually high rainfall. This soil has a high shrink-swell potential. The surface layer of this soil remains wet for long periods after heavy rains. It is sticky when wet and hard when dry. Plants are damaged by lack of water during dry periods in summer and fall of some years.

Most of the acreage is used for cultivated crops. A small acreage is in pasture and woodland.

This soil is moderately well suited to cultivated crops, mainly rice, soybeans, and grain sorghum. The main limitations are wetness and the clayey textures. This soil is difficult to keep in good tilth. It can be worked only within a narrow range of moisture content. It becomes cloddy if it is worked when it is too wet or too dry. Proper row arrangement, field drains, and grassed outlets are needed to remove excess surface water. Land grading and smoothing can also improve surface drainage. Pipe or other drop structures should be installed in drainage channels to control the water level in irrigated ricefields and to prevent excessive erosion of drainage channels. Returning crop residue to the soil or regularly adding other organic matter improves fertility, improves tilth, and increases the water intake rate.

This soil is well suited to pasture. The main limitations are wetness and the clayey surface layer. Wetness limits the choice of plants and the period of grazing. Suitable pasture plants are common bermudagrass, improved bermudagrass, dallisgrass, Pensacola bahiagrass, white clover, red clover, tall fescue, vetch, and winter peas. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture and the soil in good condition. Periodic mowing and clipping helps to maintain uniform growth, discourages selective grazing, and reduces clumpy growth. Fertilizer is needed for optimum growth of grasses and legumes.

This soil is moderately well suited to woodland. It has high potential for producing southern hardwoods. Wetness and the clayey surface layer, however, limit the use of equipment. Plant competition delays natural regeneration but does not prevent the eventual development of a fully stocked, normal stand of trees. Only trees that can tolerate seasonal wetness should be planted. Among the trees that are suitable for planting are eastern cottonwood, green ash, and sweetgum.

This soil has good potential as habitat for openland, woodland, and wetland wildlife. There are a few soil limitations affecting habitat management or development. Properly managing vegetated areas can improve the habitat for all types of wildlife. Management that encourages the growth of oak and other mast-producing trees improves the habitat for white-tailed deer and squirrels. Habitat for waterfowl can be created by constructing shallow ponds or flooding areas with the use of levees and water pumps.

This soil is poorly suited to urban development. Flooding, wetness, high shrink-swell potential, very slow permeability, low strength, and clayey textures are severe limitations where this soil is used for homesites, roads, and buildings. If buildings are constructed on this soil, properly designing foundations and footings and diverting runoff away from buildings help to prevent structural damage as a result of shrinking and swelling. Septic tank absorption fields do not function properly during rainy periods because of the wetness and very slow permeability. Local roads and streets can be designed to offset the limited ability of the soil to support a load. Adequately designed levee and drainage systems are needed to prevent flooding and reduce wetness.

This soil is poorly suited to recreational development. The main limitations are wetness, flooding, very slow permeability, and the clayey surface layer.

This soil is in capability subclass IIIw and woodland group 2w6.

Pr—Portland clay, occasionally flooded. This level, somewhat poorly drained soil is in broad flats on the flood plains of the Ouachita River, Bayou Bonne Idee, and other former channels of the Arkansas River. Areas range from about 50 to 1,000 acres. Slopes are dominantly less than 1 percent.

Typically, the surface layer is brown, mottled, medium acid clay about 11 inches thick. The subsoil is reddish brown, mottled clay. It is strongly acid in the upper part, neutral in the middle part, and moderately alkaline in the lower part. The underlying material, to a depth of about 60 inches, is reddish brown, mottled, mildly alkaline clay. In places the surface layer is silty clay loam.

Included with this soil in mapping are a few small areas of Hebert, Perry, and Rilla soils. Also included are a few small areas of Portland silt loam soils. These included areas make up about 20 percent of the map unit. The Hebert and Rilla soils are on higher positions and are loamy throughout. The Perry soils are on lower positions and have a grayer subsoil.

This Portland soil has medium fertility. Water and air move through this soil at a very slow rate. Water runs off the surface at a very slow rate and stands in low places for very long periods after heavy rains. A seasonal high water table fluctuates between the surface and a depth of about 1 foot during December through May. In winter and spring, this soil is subject to brief to very long periods of flooding. Flooding between June 1 and November 30 occurs less often than 2 years out of 5. Floodwaters are 5 feet or more in depth. The surface layer of this soil is sticky when wet and hard when dry. This soil has a high shrink-swell potential.

Most areas are in woodland. A small acreage is used for pasture and cultivated crops.

This soil is moderately well suited to pasture. If this soil is used for pasture, the main limitations are occasional flooding and wetness. Suitable pasture plants are common bermudagrass and adapted native grasses. During flood periods, cattle should be moved to adjacent protected areas or to pastures at higher elevations. It is not practical to apply high rates of lime and fertilizer because of the flooding hazard. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture and soil in good condition.

This soil is poorly suited to cultivated crops. The main limitations are flooding, wetness, and poor tilth. The main suitable crops are soybeans and grain sorghum. This soil is sticky when wet and hard when dry, and it becomes cloddy if tilled when it is too wet or too dry. Drainage is needed for most cultivated crops.

This soil is moderately well suited to the production of southern hardwoods. The main concerns in producing and harvesting timber are occasional flooding and wetness. Trees should be water tolerant, and they should be planted or harvested during dry periods. Wetness and the clayey texture of the surface layer limit the use of equipment. Among the trees that are suitable for planting are green ash, eastern cottonwood, and sweetgum. Trees commonly are subject to windthrow when the soil is excessively wet and winds are strong.

This soil has good potential as habitat for openland, woodland, and wetland wildlife. Habitat for waterfowl and furbearers can be improved by constructing shallow ponds. The habitat for white-tailed deer and squirrels can be improved by encouraging the growth of oak trees and desirable understory plants. Habitat for openland wildlife such as dove, quail, and rabbits can be improved by providing undisturbed, vegetated areas near the edges of cropland.

The soil is poorly suited to urban and recreational development. The main limitations are flooding, wetness, and the very high shrink-swell potential. Protection from flooding and an extensive drainage system are needed where this soil is used for building sites and sanitary facilities. Roads should be raised above flood levels.

This soil is in capability subclass IVw and woodland group 2w6.

Ra—Rilla silt loam, 0 to 1 percent slopes. This level, well drained soil is on the natural levees bordering Bayou Bonne Idee and other former channels and distributaries of the Arkansas River. Areas range from about 10 to 500 acres.

Typically, the surface layer is brown, strongly acid silt loam about 6 inches thick. The subsurface layer is pale brown, very strongly acid silt loam about 4 inches thick. The subsoil is strong brown, yellowish red, and reddish brown, strongly acid and very strongly acid silt loam and silty clay loam. The underlying material, to a depth of about 71 inches, is yellowish red, neutral loam.

Included in mapping are a few small areas of Gallion, Hebert, Perry, Portland, and Sterlington soils. These areas make up about 15 percent of the unit. The Gallion soils are in similar positions and are more alkaline in the lower part of the subsoil. The Hebert soils are on concave positions and are grayer in the upper part of the subsoil. The Perry and Portland soils are on lower positions and are more clayey throughout. The Sterlington soils are in higher positions and contain less clay in the subsoil.

This Rilla soil has medium fertility. It has moderately high levels of exchangeable aluminum in the root zone that are potentially toxic to some crops. Water and air move through this soil at a moderate rate. Water runs off the surface at a slow rate. Plants are damaged by lack of water during dry periods in summer and fall of some years. A seasonal high water table fluctuates between depths of 4 and 6 feet during December through April. This soil has a moderate shrink-swell potential.

Most areas are in cultivated crops. A small acreage is used for homesites, pasture, pecan orchards, and woodland.

This soil is well suited to cultivated crops, mainly cotton, soybeans, corn, rice, grain sorghum, and potatoes. This soil is friable and easy to keep in good tilth. It can be worked over a wide range of moisture content. Minimum tillage and returning all crop residue to the soil or regularly adding other organic matter improves fertility and helps to maintain soil tilth and content of organic matter. Most crops respond to fertilization and liming programs designed to overcome fertility deficiencies and moderately high levels of exchangeable aluminum in the root zone.

This soil is well suited to pasture. It has few limitations. The main suitable pasture plants are Coastal bermudagrass, improved bermudagrass, common bermudagrass, Pensacola bahiagrass, tall fescue, white clover, winter peas, and vetch. Fertilizer and lime are needed for optimum growth of grasses and legumes. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture and soil in good condition.

This soil is well suited to woodland. It has a high production potential for southern hardwoods and few limitations for use and management. Suitable trees to plant are eastern cottonwood and American sycamore.

This soil is moderately well suited to urban development. It has moderate limitations for building sites, local roads and streets, and most sanitary facilities. The main limitations are moderate shrink-swell potential, low strength as it affects local roads and streets, and moderate permeability. Buildings and roads can be designed to offset the effects of shrinking and swelling and the limited ability of the soil to support a load. Wetness and moderate permeability are limitations where septic tank absorption fields are installed. The limitation of moderate permeability can be overcome by increasing the size of the absorption field.

This soil has good potential as habitat for woodland and openland wildlife habitat. It has few limitations affecting wildlife habitat management and development. Habitat for wildlife such as rabbits, quail, and doves can easily be created or improved by planting appropriate vegetation. Habitat for white-tailed deer and squirrels can be improved by encouraging the growth of oak and other mast-producing trees.

This soil is well suited to recreational development. It has few limitations for this use.

This soil is in capability class I and woodland group 2o4.

Rb—Rilla silt loam, 1 to 3 percent slopes. This very gently sloping, well drained soil is on natural levees bordering Bayou Bonne Idee and other former channels and distributaries of the Arkansas River. Areas range from about 10 to 75 acres.

Typically, the surface layer is brown, very strongly acid silt loam about 4 inches thick. The subsoil is yellowish red, very strongly acid silty clay loam. The next layer, to a depth of about 60 inches, is yellowish red and reddish brown, strongly acid silt loam.

Included with this soil in mapping are a few small areas of Gallion, Hebert, Perry, Portland, and Sterlington soils. These areas make up about 10 percent of the unit. The Gallion soils are on similar positions and are more alkaline in the lower part of the subsoil. The Hebert soils are on concave positions and have a subsoil that is grayer in the upper part. The Perry and Portland soils are in backswamp areas and are more clayey throughout. The Sterlington soils are in higher positions and contain less clay in the subsoil.

This Rilla soil has medium fertility. It has moderately high levels of exchangeable aluminum in the root zone that are potentially toxic to some crops. Water and air move through this soil at a moderate rate. Water runs off the surface at a slow rate. Plants are damaged by lack of water during dry periods in summer and fall of some years. A seasonal high water table fluctuates between depths of 4 and 6 feet during December through April. This soil has a moderate shrink-swell potential.

Most areas are used for cultivated crops. A small acreage is used for homesites, pasture, pecan orchards, and woodland.

This soil is well suited to cultivated crops, mainly cotton, soybeans, corn, rice, and grain sorghum. The main limitations are slope and medium fertility. Using minimum tillage and returning all crop residue to the soil or regularly adding other organic matter improves fertility and helps to maintain soil tilth and content of organic matter. Most crops respond to fertility and liming programs designed to improve the fertility and overcome the potentially toxic effects of the exchangeable aluminum in the root zone.

This soil is well suited to pasture. It has few limitations for this use. The main suitable pasture plants are Coastal bermudagrass, common bermudagrass, improved bermudagrass, Pensacola bahiagrass, tall fescue, white clover, winter peas, and vetch. Fertilizer and lime are needed for optimum growth of grasses and legumes.

This soil is well suited to woodland. It has high production potential for southern hardwoods and few limitations for use and management. The main suitable trees to plant are eastern cottonwood and American sycamore.

This soil is moderately well suited to urban development. It has moderate limitations for building sites, local roads and streets, and most sanitary facilities. The main limitations are moderate shrink-swell potential, low strength as it affects local roads and streets, and moderate permeability. Buildings and roads can be designed to offset the effects of shrinking and swelling and the limited ability of the soil to support a load. Wetness and moderate permeability are limitations where septic tank absorption fields are constructed. The limitation of moderate permeability can be overcome by increasing the size of the septic tank absorption field. Revegetating disturbed areas around construction sites as soon as possible helps to control soil erosion.

This soil has good potential as habitat for openland and woodland wildlife. There are few soil limitations affecting management and development of habitat for wildlife such as rabbits, squirrels, white-tailed deer, raccoons, dove, and quail.

This soil is moderately well suited to recreational development. The main limitation is slope. Where playgrounds or paths and trails are developed, erosion is a moderate to severe hazard.

This soil is in capability subclass IIe and woodland group 2o4.

Rh—Rilla-Hebert complex, gently undulating. This complex consists of well drained Rilla soils and somewhat poorly drained Hebert soils. Both soils are on natural levees bordering Bayou Bonne Idee and other former channels and distributaries of the Arkansas River. The Rilla soils are on low ridges that are about 1 1/2 to 5 feet in height and 25 to 175 feet in width. The Hebert soils are in swales that range from 20 to 150 feet in width. The Rilla soils make up about 50 percent of the complex, and the Hebert soils about 40 percent. The Rilla soils have slopes that range from 1 to 3 percent. The Hebert soils have slopes that are dominantly less than 1 percent. Areas of these soils are so intermingled that mapping them separately was not practical at the scale selected. Areas of this complex range from about 20 to 1,000 acres.

Typically, the Rilla soils have a surface layer of brown, very strongly acid silt loam about 6 inches thick. The subsoil is yellowish red, very strongly acid silty clay loam. The underlying material, to a depth of 60 inches, is reddish brown, strongly acid silt loam.

The Rilla soils have medium fertility. They have moderately high levels of exchangeable aluminum in the root zone that are potentially toxic to some plants. Water and air move through these soils at a moderate rate. Water runs off the surface at a slow rate. A seasonal high water table fluctuates between depths of 4 and 6 feet during December to April. Adequate water is available to plants in most years. These soils have a moderate shrink-swell potential.

Typically, the Hebert soils have a surface layer of brown, medium acid silt loam about 10 inches thick. The subsoil, to a depth of about 60 inches, is light brownish gray, strongly acid silty clay loam in the upper part; reddish brown, very strongly acid silty clay loam in the middle part; and reddish brown, medium acid loam in the lower part.

The Hebert soils have medium fertility. They have moderately high levels of exchangeable aluminum in the root zone that are potentially toxic to some crops. Water and air move through these soils at a moderately slow rate. Water runs off the surface at a slow rate. A seasonal high water table fluctuates between depths of 1 1/2 and 3 feet during December through April. These soils have a moderate shrink-swell potential in the subsoil. Plants are damaged by lack of water during dry periods in summer and fall of most years.

Included with this unit in mapping are a few small areas of Perry, Portland, and Sterlington soils. Also included are a few small areas of Rilla soils that have slopes of 3 to 5 percent. These included areas make up about 10 percent of the unit. The poorly drained Perry and Portland soils are on the lowest positions and are clayey throughout. The well drained Sterlington soils are in positions similar to those of the Rilla soils, and they contain less clay in the subsoil.

Most areas of this complex are used for cultivated crops. A small acreage is used for pasture and homesites.

The soils in this complex are moderately well suited to cultivated crops, mainly cotton, soybeans, corn, grain sorghum, and truck crops. The main limitations are the wetness of the Hebert soils and the slope of the Rilla soils. These soils are friable and easy to keep in good tilth. They can be worked over a wide range of moisture content. Irregular slopes hinder tillage operations. Proper row arrangement, field drains, and grassed outlets are needed to remove excess surface water from the swales. Land grading and smoothing can improve surface drainage, but in places large volumes of soil would have to be moved. Crop residue left on or near the surface helps to conserve moisture, maintain tilth, and control erosion. Most crops respond to fertility and liming programs designed to improve the fertility and overcome the potentially toxic effects of the exchangeable aluminum in the root zone.

The soils in this unit are well suited to pasture. They have few limitations. Grazing when these soils are wet results in compaction of the surface layer. The main suitable pasture plants are Coastal bermudagrass, improved bermudagrass, common bermudagrass, Pensacola bahiagrass, tall fescue, white clover, winter peas, and vetch. Fertilizer and lime are needed for optimum growth of grasses and legumes. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture and soil in good condition.

The soils in this complex are well suited to woodland. They have high production potential for southern hardwoods and few limitations for use and management. The main suitable trees to plant are eastern cottonwood and American sycamore.

The soils in this complex are moderately well suited to urban development. The main limitations are wetness, low strength, and moderate shrink-swell potential. Drainage is needed where building foundations are constructed. Erosion can be reduced during construction by preserving the existing plant cover and revegetating disturbed areas around construction sites as soon as possible. Wetness and moderately slow permeability are limitations where septic tank absorption fields are constructed. The limitation of moderately slow permeability can be overcome by increasing the size of the absorption field. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has a low shrink-swell potential. Roads should be designed to offset the limited ability of the soils to support a load.

These soils have good potential as habitat for openland and woodland wildlife. They have few soil limitations affecting management and development. Habitat can be easily created or improved for existing wildlife such as rabbits, squirrels, white-tailed deer, raccoons, dove, and quail.

This soil is moderately well suited to recreational development. The main limitations are wetness and moderately slow permeability in the Hebert soils and slope in both the Rilla and Hebert soils.

The soils in this complex are in capability subclass IIw. The Rilla soils are in woodland group 2o4, and the Hebert soils are in 2w5.

Se—Sterlington silt loam, 0 to 1 percent slopes. This level, well drained soil is on natural levees bordering Bayou Bonne Idee and other former channels and distributaries of the Arkansas River. Areas are long and narrow and range from about 10 to 200 acres.

Typically, the surface layer is brown, medium acid silt loam about 8 inches thick. The subsoil is reddish brown, very strongly acid silt loam in the upper part; brown and dark brown, very strongly acid very fine sandy loam in the middle part; and reddish brown, very strongly acid silt loam in the lower part. The underlying material, to a depth of about 75 inches, is strong brown, strongly acid very fine sandy loam.

Included with this soil in mapping are a few small areas of Gallion, Hebert, and Rilla soils. These areas make up about 15 percent of the unit. The Gallion soils are on similar positions and are more alkaline in the subsoil. The somewhat poorly drained Hebert soils are on lower positions and have a subsoil that is grayer in the upper part. The Rilla soils are on similar positions and have a subsoil that is more clayey.

This Sterlington soil has medium fertility. It has moderately high levels of exchangeable aluminum in the root zone that are potentially toxic to some crops. Water and air move through this soil at a moderate rate. Effective rooting depth is 60 inches or more. Water runs off the surface at a slow rate. This soil dries quickly after rains. Plants generally suffer from a lack of water during dry periods in summer and fall of most years. The shrink-swell potential is low.

This soil is used mainly for cultivated crops. A small acreage is also used for pasture and homesites.

This soil is well suited to cultivated crops. It has few limitations for this use. There are moderately high levels of exchangeable aluminum in the root zone that are potentially toxic to some crops. The main suitable crops are cotton, soybeans, corn, grain sorghum, and truck crops. This soil is friable and easy to keep in good tilth. It can be worked over a wide range of moisture content. Traffic pans develop easily but can be broken up by deep plowing or chiseling. Returning crop residue to the soil or regularly adding other organic matter improves fertility, reduces crusting, and increases the water intake rate. Most crops respond to fertility and liming programs designed to improve the fertility and overcome the potentially toxic effects of the exchangeable aluminum in the root zone.

This soil is well suited to pasture. It has a few limitations. The main suitable pasture plants are Coastal bermudagrass, improved bermudagrass, common bermudagrass, Pensacola bahiagrass, tall fescue, white clover, winter peas, and vetch. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture and soil in good condition. Fertilizer and lime are needed for optimum growth of grasses and legumes.

This soil is well suited to woodland. It has high production potential for southern hardwoods, but few areas remain in woods. The main trees suitable to plant are eastern cottonwood.

This soil has good potential as habitat for openland and woodland wildlife. Habitat for openland wildlife such as doves, rabbits, and quail can easily be created or improved by planting appropriate vegetation. In wooded areas, habitat for white-tailed deer and squirrels can be improved by encouraging the growth of oak and other mast-producing trees.

This soil is well suited to urban and recreational development. It has few limitations for building sites, local roads and streets, and most sanitary facilities. Moderate permeability, however, is a limitation where septic tank absorption fields are installed. This limitation can be overcome by increasing the size of the absorption field. Homesite development should be done in a way that preserves as many trees as possible.

This Sterlington soil is in capability class I and woodland group 2o4.

Sr—Sterlington silt loam, 1 to 3 percent slopes. This very gently sloping, well drained soil is on natural levees bordering Bayou Bonne Idee and other former channels and distributaries of the Arkansas River. Areas are long and narrow and range from about 10 to 100 acres.

Typically, the surface layer is about 8 inches thick. It is dark brown, medium acid silt loam in the upper part and brown, strongly acid very fine sandy loam in the lower part. The subsoil is reddish brown, very strongly acid silt loam in the upper part; strong brown and brown, very strongly acid very fine sandy loam and silt loam in the middle part; and yellowish red, very strongly acid very fine sandy loam in the lower part. In places, the surface layer is very fine sandy loam in the upper part.

Included with this soil in mapping are a few small areas of Hebert and Rilla soils. Also included are a few small areas of Sterlington soils on slopes that range from 3 to 5 percent. These included areas make up about 15 percent of the unit. The somewhat poorly drained Hebert soils are on lower positions and have a subsoil that is grayer in the upper part. The Rilla soils are on similar positions and have a subsoil that is more clayey.

This Sterlington soil has medium fertility. It has moderately high levels of exchangeable aluminum in the root zone that are potentially toxic to some crops. Water and air move through this soil at a moderate rate. Water runs off the surface at a slow rate. This soil dries quickly after rains. Plants generally suffer from a lack of water during dry periods in summer and fall of most years. The shrink-swell potential is low.

Most areas of this soil are used for cultivated crops. A small acreage is used for pasture, pecan orchards, and homesites.

This soil is well suited to cultivated crops. The main limitations are slope and moderately high levels of exchangeable aluminum. The main suitable crops are cotton, soybeans, corn, grain sorghum, and truck crops. This soil is friable and easy to keep in good tilth. It can be worked over a wide range of moisture content. All tillage should be on the contour or across the slope. Crop residue left on or near the surface helps to conserve moisture, maintain tilth, and control erosion. Most crops respond to fertility and liming programs designed to improve the fertility deficiencies and overcome the potentially toxic effects of the exchangeable aluminum in the root zone.

This soil is well suited to pasture. It has few limitations. The main suitable pasture plants are Coastal bermudagrass, improved bermudagrass, common bermudagrass, Pensacola bahiagrass, tall fescue, white clover, winter peas, and vetch. Seedbed preparation should be on the contour or across the slope where practical. Fertilizer and lime are needed for optimum growth of grasses and legumes. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture and soil in good condition.

This soil is well suited to woodland. It has high production potential for southern hardwoods, but few areas remain in woods. The main suitable trees to plant are eastern cottonwood.

This soil has good potential as habitat for openland and woodland wildlife. Habitat for openland wildlife such as rabbits, doves, and quail can be created by planting appropriate vegetation. Management that enhances the growth of oak or other mast-producing trees can improve the habitat for white-tailed deer and squirrels.

This soil is well suited to urban and recreational development. It has few limitations for building sites, local roads and streets, and most sanitary facilities. It has moderate limitations for playgrounds and paths and trails. The moderate permeability is a limitation where septic tank absorption fields are installed, but this limitation can be overcome by increasing the size of the field. The hazard of erosion is increased if the soil is left exposed during site development. Homesite development should be done in a way that preserves as many trees as possible.

This soil is in capability subclass IIe and woodland group 2o4.

St—Sterlington-Hebert complex, gently undulating. This complex consists of well drained Sterlington soils and somewhat poorly drained Hebert soils. These soils are on natural levees bordering Bayou Bonne Idee and other former channels and distributaries of the Arkansas River. The Sterlington soil is on ridges that range from 1 1/2 to 6 feet in height and 30 to 200 feet in width. The Hebert soils are in swales that range from 20 to 150 feet in width. The Sterlington soils make up about 50 percent of the complex, and Hebert soils about 35 percent. Areas of these soils are so intermingled that mapping them separately was not practical at the scale selected. Areas of this complex range from 20 to 1,000 acres. Slopes range from 1 to 3 percent in the Sterlington soils and from 0 to 1 percent in the Hebert soils.

Typically, the Sterlington soils have a surface layer of dark yellowish brown, medium acid silt loam about 5 inches thick. The subsurface layer is brown, strongly acid silt loam about 10 inches thick. The subsoil, to a depth of about 60 inches, is yellowish red, very strongly acid very fine sandy loam in the upper part and yellowish red, very strongly acid silt loam in the lower part.

The Sterlington soils have medium fertility. They have moderately high levels of exchangeable aluminum in the root zone that are potentially toxic to some crops. Water and air move through these soils at a moderate rate. Effective rooting depth is 60 inches or more. Water runs off the surface at a slow rate. These soils dry quickly after rains. Plants generally suffer from a lack of water during dry periods in summer and fall of most years.

Typically, the Hebert soils have a surface layer of dark brown, strongly acid silt loam about 9 inches thick. The subsurface layer is light brownish gray, mottled, medium acid silt loam about 6 inches thick. The subsoil, to a depth of about 60 inches, is pale brown and brown, mottled, medium acid silty clay loam in the upper part; reddish brown, mottled, very strongly acid silty clay loam in the middle part; and reddish brown, mottled, strongly acid silt loam in the lower part.

The Hebert soils have medium fertility. They have moderately high levels of exchangeable aluminum in the root zone that are potentially toxic to some crops. Water and air move through these soils at a moderately slow rate. Water runs off the surface at a slow rate. A seasonal high water table fluctuates between depths of 1 1/2 and 3 feet during December through April. These soils have a moderate shrink-swell potential in the subsoil. Plants are damaged by lack of water during dry periods in summer and fall of most years.

Included with this unit in mapping are a few small areas of Perry, Portland, and Rilla soils. Also included are a few small areas of Sterlington soils that have slopes in excess of 3 percent. These included areas make up about 15 percent of the unit. The poorly drained Perry soils and somewhat poorly drained Portland soils are on the lowest positions and are clayey throughout. The well drained Rilla soils are on positions similar to those of the Rilla soils and have a more clayey subsoil.

Most areas of this unit are used for cultivated crops. A few areas are used for pecan orchards, pasture, and homesites.

The soils in this unit are well suited to cultivated crops. The main limitations are wetness in the swales, slope on the ridges, and moderately high levels of exchangeable aluminum in the root zone. These soils are friable and easy to keep in good tilth. They can be worked over a wide range of moisture content. Surface crusting is a minor problem. Irregular slopes hinder tillage operations. The main suitable crops are cotton, soybeans, grain sorghum, corn, and truck crops. Proper row arrangement, field drainageways, and grassed outlets are needed to remove excess surface water from the swales. Land grading and smoothing can improve surface drainage, but in places large volumes of soil would have to be moved. Crop residue left on or near the surface helps to conserve moisture, maintain tilth, and control erosion. Most crops respond to fertility and liming programs designed to improve fertility and overcome the potentially toxic effects of the exchangeable aluminum in the root zone.

The soils in this unit are well suited to pasture. They have few limitations. Grazing when the soils are wet results in compaction of the surface layer. The main suitable pasture plants are Coastal bermudagrass, improved bermudagrass, common bermudagrass (fig. 7), Pensacola bahiagrass, tall fescue, white clover, winter peas, and vetch. Fertilizer and lime are needed for optimum growth of grasses and legumes. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture and soil in good condition.

The soils in this complex are well suited to woodland. They have high production potential for southern hardwoods, but few areas remain in woods. The main trees suitable to plant are eastern cottonwood and American sycamore.

Figure 7.—Improved pasture of common bermudagrass and improved bermudagrass on the Sterlington-Hebert complex, gently undulating.

The soils of this complex have good potential for use as habitat for openland and woodland wildlife. Habitat can easily be created and maintained by planting appropriate vegetation or encouraging the growth of existing vegetation.

The soils in this map unit are moderately well suited to urban development. The main limitations are moderate permeability in the Sterlington soil and wetness, low strength as it affects local roads and streets, moderately slow permeability, and moderate shrink-swell potential in the Hebert soils. Drainage is needed where building foundations are constructed. Preserving the existing plant cover helps to reduce erosion during construction. Where septic tank absorption fields are constructed, wetness and moderately slow permeability are limitations. These limitations can be overcome by increasing the size of the absorption field. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has a low shrink-swell potential.

The soils in this unit are moderately well suited to recreational development. The main limitations are wetness and moderately slow permeability in the Hebert soils and slope in the Sterlington soils.

The soils in this complex are in capability subclass IIw. The Sterlington soils are in woodland group 2o4, and the Hebert soils are in 2w5.

To—Tillou silt loam. This nearly level, somewhat poorly drained soil is on broad flats on the terrace uplands. Areas range from about 20 to 1,000 acres. Slopes range from 0 to 2 percent.

Typically, the surface layer is dark grayish brown, strongly acid silt loam about 5 inches thick. The subsurface layer is brown, very strongly acid silt loam about 3 inches thick. The subsoil, to a depth of about 76 inches, is yellowish brown, mottled, very strongly acid silt loam in the upper part; yellowish brown and light gray, mottled silt loam and silty clay loam in the middle part; and yellowish brown, brownish yellow, and light yellowish brown, mottled silt loam and silty clay loam in the lower part.

Included with this soil in mapping are a few small areas of Bussy, Debute, and Guyton soils. These areas make up about 10 percent of the unit. The Bussy and Debute soils are on more sloping positions and have a fragipan. The Guyton soils are on creek bottoms and in depressional areas and have a subsoil that is grayer.

This Tillou soil has low fertility. It has high levels of exchangeable aluminum in the root zone that are potentially toxic to most crops. Water and air move through this soil at a slow rate. Water runs off the surface at a slow rate. A seasonal high water table fluctuates between depths of 1/2 foot and 2 1/2 feet during December through April. Plants are damaged by lack of water during dry periods in summer and fall of most years. This soil has a moderate shrink-swell potential.

Most areas of this soil are in woodland. A few areas are used for pasture, cultivated crops, and homesites.

This soil is moderately well suited to cultivated crops. The main limitations are low fertility, high levels of exchangeable aluminum in the root zone, and wetness. The main crops grown are soybeans and truck crops. A drainage system is needed for most cultivated crops. Most crops respond to fertilizer and liming programs designed to improve the fertility and overcome the potentially toxic effects of the exchangeable aluminum in the root zone. In areas where water of suitable quality is available, supplemental irrigation can prevent the damage to crops that results during dry periods of most years.

This soil is well suited to pasture. The main limitations are wetness and low fertility. Suitable pasture plants are common bermudagrass, Coastal bermudagrass, Pensacola bahiagrass, ryegrass, white clover, vetch, and winter peas. Proper grazing practices, weed control, and fertilizer are needed for maximum quality of forage. Grazing when the soil is wet results in compaction of the surface layer. Pasture plants respond to fertilizer and liming programs designed to improve the fertility.

This soil is well suited to the production of loblolly pine, sweetgum, and water oak. Reforestation after harvesting must be carefully managed to reduce competition from undesirable understory plants. Trees should be water tolerant, and they should be planted or harvested during dry periods. Among the trees that are suitable for planting are loblolly pine, slash pine, sweetgum, and water oak. Conventional methods of harvesting timber generally are suitable, but the soil may be compacted if it is wet and heavy equipment is used.

This soil has good potential as habitat for openland and woodland wildlife and fair potential for wetland wildlife. Habitat can be created or maintained by planting appropriate vegetation and encouraging the growth of existing vegetation. The habitat for wetland wildlife can be improved by constructing shallow ponds to provide open water areas for waterfowl and furbearers.

This soil is poorly suited to urban and recreational development. It has severe limitations for building sites, local roads and streets, most sanitary facilties, and most recreational uses. Wetness, slow permeability, and moderate shrink-swell potential are the main limitations. Drainage is needed if roads and building foundations are constructed. Excess water can be removed by using shallow ditches and providing the proper grade for drainage. Homesite development should be done in a way that preserves as many trees as possible. Septic tank absorption fields do not function properly during rainy periods because of wetness and slow permeability.

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

UB—Udalfs-Bussy association, 5 to 30 percent slopes. This association consists of moderately sloping to steep soils. These soils are in a regular and repeating pattern on escarpments between terrace uplands and bottom lands. The landscape consists of steep side slopes that are dissected by many narrow drainageways. Areas are as large as several hundred acres. The composition of this unit varies between mapped areas, but mapping was controlled well enough to evaluate the soils for the expected use. The moderately sloping to steeply sloping Udalfs are on mid and lower side slopes. The moderately sloping Bussy soils are on ridges and on the upper parts of the escarpment. The Udalfs make up about 60 percent of the map unit, and the Bussy soils about 25 percent. Slopes range from 5 to 30 percent in the Udalfs and from 5 to 8 percent in the Bussy soils.

The Udalfs are so variable that no one profile can be considered typical. They range from excessively drained to somewhat poorly drained. Texture ranges from sandy to clayey. Colors are also variable. Generally the soil is strongly acid or very strongly acid throughout, but it ranges from very strongly acid to mildly alkaline.

The Udalfs have low fertility. Runoff is rapid and very rapid, and the hazard of erosion is severe. Other properties are too variable to rate.

Typically, the moderately well drained Bussy soils have a surface layer of brown, strongly acid silt loam about 4 inches thick. The subsoil is yellowish brown, very strongly acid silt loam in the upper part. The lower part of the subsoil, to a depth of about 60 inches, is a yellowish brown, strongly acid silt loam fragipan.

The Bussy soils have low fertility. They have high levels of exchangeable aluminum that are potentially toxic to most crops. Water and air move through these soils at a moderate rate in the upper part of the subsoil and a slow rate in the fragipan. Water runs off the surface at a medium rate. A seasonal high water table is perched above the fragipan during December through

March. These soils have a moderate shrink-swell potential.

Included with this unit in mapping are a few small areas of Guyton and Tillou soils. These areas make up about 15 percent of the unit. The Guyton soils are along the drainageways and have a grayer subsoil than the Bussy soils. The Tillou soils are on some of the less sloping areas and do not have a fragipan.

Most of the acreage is used for woodland and pasture. A small acreage is managed for wildlife habitat.

The soils in this map unit are moderately well suited to pasture. The main limitations are the steep slopes and low fertility. Use of lime and fertilizer can overcome the low fertility and promote good growth of forage plants. The use of equipment is limited by the steep slopes. Periodic mowing and clipping, where possible, helps to maintain uniform growth, discourages selective grazing, and reduces clumpy growth. Suitable pasture plants are Coastal bermudagrass, common bermudagrass, Pensacola bahiagrass, crimson clover, and ball clover. Native grasses are best suited to steeply sloping areas where seedbed preparation is difficult.

The soils in this association are moderately well suited to the production of pine. Steep slopes and gullies limit the use of equipment. Conventional methods of harvesting trees can be used in the more gently sloping areas but are difficult to use in the steeper areas. Management that minimizes the risk of erosion is essential in harvesting timber. Among the trees that are suitable for planting are loblolly pine and slash pine.

This association has good potential as habitat for woodland wildlife. Habitat for white-tailed deer and squirrels can be improved by planting or encouraging the growth of existing oak trees and suitable understory plants.

This association is poorly suited to urban and recreational development. The main limitations are steep slopes in the Udalfs soil. Additional limitations are wetness, slow permeability, and low strength in the Bussy soil. Erosion is a hazard. Only the part of the site that is used for construction should be disturbed. Where septic tanks are installed, effluent from absorption fields can surface in downslope areas and create a hazard to health.

The soils in this map unit are in capability subclass VIe. Udalfs are not assigned to a woodland group. The Bussy soils are in woodland group 2o7.

Wr—Wrightsville silt loam. This level, poorly drained soil is on low stream terraces above the flood plains of the Ouachita River. Areas range from about 40 to 500 acres. Slopes are dominantly less than 1 percent.

Typically, the surface layer is dark grayish brown, very strongly acid silt loam about 2 inches thick. The subsurface layer is light brownish gray, mottled, very strongly acid silt loam about 9 inches thick. The subsoil is gray, mottled, very strongly acid silty clay loam in the upper part; light brownish gray, mottled, very strongly acid silty clay in the middle part; and light brownish gray, mottled, very strongly acid silty clay in the lower part. The underlying material, to a depth of about 73 inches, is gray, mottled, slightly acid silty clay.

Included with this soil in mapping are a few small areas of Groom, Guyton, Libuse, Perry, and Portland soils. These areas make up about 10 percent of the unit. The Groom soils are in similar positions and contain less clay in the subsoil. The poorly drained Guyton soils are along some of the drainageways and contain less clay in the subsoil. The Libuse soils are on slightly higher positions and have a fragipan. The poorly drained Perry and Portland soils are on slightly lower positions along some of the drainageways and contain more clay throughout.

This Wrightsville soil has low fertility. It has high levels of exchangeable aluminum in the root zone that are potentially toxic to most crops. Water and air move through this soil at a very slow rate. Water runs off the surface at a slow rate and stands in low places for long periods. A seasonal high water table fluctuates between depths of 1/2 foot and 1 1/2 feet during December through April. Flooding is rare, but it can occur after unusually heavy rains. This soil remains wet for long periods after heavy rains. It has a high shrink-swell potential in the subsoil. Plants are damaged by lack of water during dry periods in summer and fall of most years.

Most areas of this soil are in woodland. A few areas are used for cultivated crops and pasture.

This soil is moderately well suited to cultivated crops, mainly rice and soybeans. The main limitations are wetness, low fertility, and potentially toxic levels of exchangeable aluminum in the root zone. A drainage system is needed for most cultivated crops. Proper irrigation systems should be used for the production of rice. Crop residue management helps maintain content of organic matter and reduce surface crusting. Most crops respond to fertility and liming programs designed to improve the fertility and overcome the potentially toxic levels of exchangeable aluminum in the root zone.

This soil is moderately well suited to woodland. The main trees suitable to plant are loblolly pine, sweetgum, willow oak, and water oak. Wetness is the main limitation. Reforestation, after harvesting, must be carefully managed to reduce competition from undesirable understory plants. Only trees that can tolerate seasonal wetness should be planted. Conventional methods of harvesting timber generally can be used, but their use may be limited during rainy periods, generally from December to May.

This soil is well suited to pasture. Wetness and low fertility are the main limitations. Suitable pasture plants are common bermudagrass, Pensacola bahiagrass, tall fescue, white clover, vetch, and winter peas. A drainage system is needed for most pasture plants. Use of proper stocking rates, pasture rotation, and restricted grazing during wet periods helps to keep the pasture and soil in good condition. Fertilizer and lime are needed for optimum growth of grasses and legumes.

This soil has good potential as habitat for wetland wildlife and fair potential for openland and woodland wildlife. Habitat for waterfowl and furbearers can be created by constructing shallow ponds. Habitat for white-tailed deer and squirrels can be improved by encouraging the growth of oak and other mast-producing trees.

This soil is poorly suited to urban and recreational development. The main limitations are wetness, flooding, very slow permeability, low strength as it affects local roads and streets, and high shrink-swell potential. Drainage is needed if roads and building foundations are constructed. Buildings and roads should be designed to offset the limited ability of this soil to support a load. If buildings are constructed on this soil, properly designing foundations and footings and diverting runoff away from buildings help to prevent structural damage caused by shrinking and swelling. Septic tank absorption fields do not function properly during rainy periods because of the wetness and very slow permeability.

This Wrightsville soil is in capability subclass IIIw and woodland group 3w9.

Yo—Yorktown clay, frequently flooded. This level, very poorly drained soil is in former stream channels and sloughs along Bayou Bonne Idee and Bayou Bartholomew. Areas range from about 20 to 250 acres. Slopes are less than 1 percent.

Typically, the surface is covered with a mat of partially decomposed leaves, roots, and twigs about 2 inches thick. The next layer is dark gray, very strongly acid clay about 7 inches thick. The subsoil, in the upper and middle parts, is dark gray and gray, mottled, very strongly acid clay. The lower part of the subsoil, to a depth of about 60 inches, is reddish brown, mottled, very strongly acid clay.

Included with this soil in mapping are a few small areas of Hebert, Perry, and Portland soils. The somewhat poorly drained Hebert soils are on higher positions and are loamy throughout. The poorly drained Perry soils and the somewhat poorly drained Portland soils are on slightly higher positions and become dry enough in most years to shrink and crack.

This Yorktown soil has medium fertility. Water and air move through this soil at a very slow rate. This soil is ponded under as much as 5 feet of water for a period of at least 10 months during most years. The shrink-swell potential is very high.

The entire acreage of this soil is in woodland, mainly baldcypress (fig. 8), water tupelo, water hickory, and green ash. It is used mainly for wildlife habitat. Some timber is cut for commercial use.

Figure 8.—Baldcypress trees, hung with Spanish Moss, are common on Yorktown clay, frequently flooded.

This soil has fair potential as habitat for wetland wildlife. Habitat can be easily maintained for waterfowl and furbearers. Habitat can be improved for wetland wildlife by constructing shallow ponds to provide areas of open water throughout the year.

This soil is moderately well suited to woodland. It has moderate potential for the production of bottomland hardwoods. The main suitable trees to plant are baldcypress, green ash, and water tupelo. Special equipment and methods are needed for planting and harvesting trees because of wetness.

This soil is generally not suited to cultivated crops, pasture, recreational development, and urban development. Wetness from ponding severely limits these uses.

This Yorktown soil is in capability subclass VIIw and woodland group 4w9.

Prime Farmland

Prime farmland, as defined by the U.S. Department of Agriculture, is the land best suited to producing food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and moisture supply needed to economically produce sustained high crop yields if acceptable farming methods are used. With minimal inputs of energy and money, prime farmland produces higher yields and farming it causes less damage to the environment than farming other types of land. Prime farmland is of major importance in satisfying the nation's short- and long-range needs for food and fiber. The amount of this high-quality farmland is limited, and it should be used with wisdom and foresight.

Prime farmland may now be cropland, pasture, woodland, or anything other than urban and built-up land or water areas. It must either be used for producing food or fiber or be available for these uses.

The soils that make up prime farmland usually have an adequate and dependable supply of moisture from precipitation. The temperature and growing season are favorable. The acidity or alkalinity is suitable. They have few, if any, rocks and are permeable to water and air. Prime farmland soils are not excessively erodible or saturated with water for long periods and generally are not frequently flooded during the growing season. The slopes range mainly from 0 to 6 percent. For more detailed information on the criteria for prime farmland consult the local staff of the Soil Conservation Service.

Nearly 71 percent, or about 365,619 acres, of Morehouse Parish meets the requirements for prime farmland. Areas are scattered throughout the parish. About 232,000 acres of this prime farmland is used for crops.

Conversion of land to urban and related uses has resulted in the loss of some prime farmland. This increases the agricultural use of less suitable soils, which are generally more erodible, droughty, and difficult to cultivate and are usually less productive.

The detailed soil map units that make up the prime farmland in Morehouse Parish are listed in this section. This list, however, does not constitute a recommendation for a particular land use.

Some of the soils that have limitations—such as seasonal high water table, flooding, or inadequate moisture—may qualify as prime farmland if these limitations are overcome by certain corrective measures. Only those soils are listed, however, that have few limitations and need no additional improvements to qualify as prime farmland. The following map units meet the soil requirements for prime farmland except where the use is urban or built-up land [1]:

Db	Debute silt loam, 1 to 3 percent slopes
Dx	Dexter silt loam, 3 to 5 percent slopes
Fo	Forestdale silty clay loam
Fr	Frizzell silt loam [2]
Ga	Gallion silt loam
Gb	Gallion silty clay loam
Gu	Guyton silt loam [2]
Hr	Hebert silt loam
Ht	Hebert silty clay loam
Id	Idee-Forestdale complex
Ie	Idee-Goodwill complex
Me	Mer Rouge silt loam
Mo	Mer Rouge silty clay loam
Mr	Mer Rouge-Gallion complex
Pc	Perry clay, 0 to 1 percent slopes
Pe	Perry clay, gently undulating
Pn	Portland silt loam
Po	Portland clay
Ra	Rilla silt loam, 0 to 1 percent slopes
Rb	Rilla silt loam, 1 to 3 percent slopes
Rh	Rilla-Hebert complex, gently undulating
Se	Sterlington silt loam, 0 to 1 percent slopes
Sr	Sterlington silt loam, 1 to 3 percent slopes
St	Sterlington-Hebert complex, gently undulating
Wr	Wrightsville silt loam [2]

[1] Urban and built-up land is any contiguous unit of land 10 acres or more that is used for such purposes as residences, industrial sites, commercial sites, construction sites, institutional sites, public administrative sites, railroad yards, small parks, cemeteries, airports, golf courses, sanitary landfills, sewage treatment plants, and water-control structures and spillways.

[2] Potentially toxic levels of exchangeable aluminum in these soils may either require special management techniques or limit the choice of crops grown.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and suitabilities of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the suitabilities and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

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

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

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

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Specific recommendations for fertilizers, crop varieties, and seeding mixtures are not given here because these change from time to time as more complete information is obtained. Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed Soil Map Units." More detailed information can be obtained from the local office of the Soil Conservation Service, the Cooperative Extension Service, and the Louisiana Agricultural Experiment Station.

About 257,000 acres in Morehouse Parish was used for crops and pasture in 1978, according to the Census of Agriculture. Of this total, about 241,000 acres was used for crops—mainly cotton, soybeans, and rice—and about 16,000 acres was used for pasture. From 1974 to 1978 the amount of cropland gradually increased and the amount of pasture decreased. There has been a gradual increase in the amount of urban land.

Differences in crop suitability and management needs result from differences in soil characteristics, such as fertility levels, erodibility, organic matter content, availability of water for plant growth, drainage, and flooding hazards. Cropping systems and soil tillage are also an important part of management. Each farm has a unique soil pattern; therefore, each has unique management problems. Not all principles of farm management, however, apply to all soils and crops. This section describes the general principles of management that can be applied widely to the soils of Morehouse Parish.

Fertilization and liming. The amount of fertilizer or lime needed depends upon the following: (1) the crop to be grown, (2) the past cropping history, (3) the level of yield desired, and (4) the nature of the soil. Applications of fertilizer and lime should be based on laboratory analysis of soil samples from each field.

In the upper 20 inches, the soils in Morehouse Parish range in reaction from extremely acid to moderately alkaline. The more acid soils may require lime.

Most of the soils in the parish contain quantities of exchangeable aluminum that are potentially toxic to some plants. Although soil treatments for this condition have not been thoroughly studied, applying lime is probably the most widespread method of reducing exchangeable aluminum levels.

Additional information on the levels of soil fertility, fertilization, and liming is provided in the section "Soil Fertility."

Organic matter content. Organic matter is important as a source of nitrogen for plant growth. It is also important in increasing the rate water is taken into the soil, in reducing surface crusting and soil losses by erosion, and in promoting good physical condition of the surface layer.

Most of the cultivated soils in Morehouse Parish are moderately low in organic matter content. Organic matter can be maintained and built up to a limited extent by leaving plant residues on the soil, by promoting more plant growth, by growing plants with extensive root systems, and by growing perennial grasses and legumes in rotation with other crops.

Soil tillage. The major purpose of soil tillage is seedbed preparation and weed control. Preparing seedbeds, cultivating, and harvesting tend to damage soil structure. Excessive cultivation of the soils should be avoided. Some of the clayey soils in the parish become cloddy when cultivated.

A compacted layer develops in the loamy soils if they are plowed at the same depth for long periods or are plowed when wet. This compact layer is generally known as a traffic pan or plow pan, and it develops just below the plow layers. The development of this compacted layer can be avoided by not plowing when the soil is wet, by changing to another depth of plowing, or by subsoiling or chiseling.

Some tillage implements stir the surface and leave crop residues on the soil surface for protection from beating rains. This helps control erosion, reduce runoff, and increase infiltration.

Drainage. Many of the soils in the parish need surface drainage to make them more suitable for crops. In the past, drainage methods have involved a complex pattern of main ditches, laterals, and field drains. A more recent approach to drainage in this parish is a combination of land leveling and grading with a minimum of open ditches. This creates larger and more uniformly shaped fields, which are more suited to the use of modern, multirow farm machinery.

Water for plant growth. The available water-holding capacity of the soils in the parish ranges from low to high, but in many years sufficient water is not available at the critical time for optimum plant growth unless irrigation is used. There are large amounts of rainfall in winter and spring. Sufficient rain generally falls in summer and autumn of most years; however, plants lack water on most soils during dry periods in summer and autumn. This rainfall pattern favors the growth of early-maturing crops.

Cropping system. A good cropping system should include a legume for nitrogen, a cultivated crop to aid in weed control, a deep-rooted crop to utilize subsoil fertility and maintain subsoil permeability, and a close-growing crop to help maintain the content of organic matter. The sequence of crops should be such that the soil has plant cover during as much of the year as possible.

The cropping system most suitable varies according to the needs of the farmer and the characteristics of the soil. Producers of livestock, for example, generally use cropping systems that have a higher percentage of pasture than the cropping systems on cash-crop farms.

Control of erosion. Soil erosion is a concern on soils that are bare of vegetative cover on the uplands of Morehouse Parish. It is also a problem on the gently sloping soils on the bottomlands. Sheet erosion is moderately severe in all fallow fields and in newly constructed drainage ditches. Some gullies erode, mainly on the more sloping soils and at overfalls into drainage ditches. Sheet and gully erosion can be reduced by maintaining a cover of vegetation or plant residues on the soil surface during as much of the year as possible, by farming on the contour or stripcropping where possible, by using minimum tillage, and by controlling weeds by methods other than fallow plowing. New drainage ditches should be seeded immediately after construction. Water-control structures placed at overfalls into drainage ditches help control gully erosion.

Pasture. Perennial grasses or legumes, or mixtures of both, are grown for pasture and hay. The mixtures generally consist of either a summer or a winter perennial grass and a suitable legume. In addition, many farmers seed small grain or ryegrass in the fall for winter and spring forage. Excess grass in summer is harvested as hay for use in winter.

Common bermudagrass, improved bermudagrass, Coastal bermudagrass, and Pensacola bahiagrass are the summer perennials most commonly grown. Improved bermudagrass, Coastal bermudagrass, and Pensacola bahiagrass produce good forage. Tall fescue, the chief winter perennial grass now grown in the parish grows well only on soils that have a favorable moisture content. All of these grasses respond well to fertilizer, particularly nitrogen. White clover, crimson clover, ball clover, arrowleaf clover, vetch, and southern wild winter peas are the most commonly grown legumes. All of these legumes respond well to lime, particularly on acid soils.

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

Some farmers obtain additional forage by grazing the understory native plants in woodland. Forage yields vary with the woodland sites, native forage condition, and density of the timber stand. Although most woodland is managed mainly for timber production, substantial volumes of forage can be obtained from woodland under good management. Stocking rates and grazing periods need to be carefully managed to obtain optimum forage production and to maintain an adequate cover of understory plants to control erosion.

Yields

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 7. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

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

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

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

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

Crops other than those shown in table 7 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor does it consider possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey. These levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have 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 generally unsuitable for cultivation.

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

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

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

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

The total acreage of soils in each capability class and subclass is shown in table 8. The capability classification of each map unit is given in the section "Detailed Soil Map Units."

Woodland Management and Productivity

The total forest area in Morehouse Parish is 200,600 acres, of which 97 percent is privately owned and 3 percent is publicly owned. Commercial forests cover 39 percent of the parish (*42*).

Forest types in the parish are: 3 percent longleaf-slash pine, 26.5 percent loblolly-shortleaf pine< 11.7 percent oak-pine, 5.8 percent oak-hickory, 50 percent oak-gum-cypress, and 3 percent elm-ash-cottonwood.

Most of the oak-gum-cypress forest type is on the alluvial plains of Bonne Idee, Bartholomew, and Lafourche Bayous, and the Ouachita River.

Tree planting on the terrace uplands has been an important woodland conservation practice. Many trees were planted in the late 1950's.

Prescribed burning is a desirable woodland conservation practice. This practice is not recommended in some parts of the parish because producing gas wells make prescribed burning a safety hazard. Pipelines and other structures interfere with the location of fire lanes.

Adequate markets for timber products are in Morehouse Parish and adjacent areas. Managed woodlands are also of value for wildlife habitat, recreation, soil and water conservation, and natural beauty.

Table 9 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination (woodland suitability group) symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *w* indicates excessive water in or on the soil. The letter *o* indicates that limitations or restrictions are insignificant.

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

In table 9, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well-managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or in equipment; and *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

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

Ratings of *windthrow hazard* are based on soil characteristics that affect the development of tree roots and the ability of the soil to hold trees firmly. A rating of *slight* indicates that few trees may be blown down by strong winds; *moderate*, that some trees will be blown down during periods of excessive soil wetness and strong winds; and *severe*, that many trees are blown down during periods of excessive soil wetness and moderate or strong winds.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. Site index was determined at age 30 years for eastern cottonwood, 35 years for American sycamore, and 50 years for all other species. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

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

Recreation

The soils of the survey area are rated in table 10 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 10, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 10 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 13 and interpretations for dwellings without basements and for local roads and streets in table 12.

Camp areas require site preparation such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface absorbs rainfall readily but remains firm. Strong slopes can greatly increase the cost of constructing campsites.

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

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is firm after rains, and is not dusty when dry.

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

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Billy R. Craft, state staff biologist, Soil Conservation Service, helped prepare this section.

Morehouse Parish, which is mainly rural, provides habitat for many types of wildlife. About 40 percent of the parish, or 204,586 acres, consists of open agricultural lands. These lands provide habitat for such species as mourning dove, bobwhite quail, snipe, woodcock, cottontail and swamp rabbits, sparrows, killdeer, and many other nongame animals. Many species of wintering waterfowl also utilize the temporarily flooded fields in the parish. Coulee Refuge, near the town of Oak Ridge, serves as a valuable waterfowl nesting, resting, and refuge area.

About 39 percent of the parish, or 200,600 acres, is forested. The forest types range from pure pine types in the northwestern part of the parish to bottomland hardwood types in the eastern part. In recent years, clearing of the bottomland hardwoods for soybean and rice production has significantly decreased the acreage of this type of wildlife habitat.

The forested areas contain moderate to high populations of white-tailed deer, gray and fox squirrel, swamp and cottontail rabbit, wild turkey, wood duck, mink, raccoon, opossum, nutria, coyote, woodcock, wading birds (ibis, herons, and egrets), reptiles, amphibians, nongame birds, and wintering species of waterfowl. Some of the pine areas in the northwestern part of the parish provide fair to good habitat for bobwhite quail. Much of the forested land is leased by hunting clubs mainly for deer, turkey, and quail hunting.

A few large tracts of land are intensively managed for wildlife habitat. The 28,000-acre Georgia Pacific Wildlife Management Area, leased by the Louisiana Department of Wildlife and Fisheries, and a small portion of the Russell Sage Wildlife Management Area, owned by the state, are in Morehouse Parish and provide habitat for woodland wildlife. Part of the Upper Ouachita National Wildlife Refuge, owned by the U.S. Fish and Wildlife Service, is also in the parish.

The Water Bank Program of the U.S. Department of Agriculture is active in Morehouse Parish. This program is designed to retain important wetland areas for use by waterfowl. Currently, about 4,000 acres has been improved and preserved as habitat for wetland wildlife.

The many ponds, lakes, rivers, and bayous in the parish provide good, year-round fishing. Species include largemouth bass, white bass, yellow bass, white and black crappie, bream (sunfish), buffalo, bowfin, gar, carp, and shad. The 400 farm ponds in the parish generally contain largemouth bass and bluegills. Some of the larger streams in the parish are the Ouachita River, Boeuf River, Bayou Bonne Idee, Bayou Bartholomew, Bayou Lafourche, and Bayou Galion.

A small acreage is used for crawfish farming, and it is expected that this enterprise will increase. Rice and crawfish can be grown well in rotation. Because of the large acreages of suitable soils and ricefields, Morehouse Parish has good potential for crawfish farming.

Morehouse Parish harbors several endangered, threatened, or unique species, such as the bald eagle, American alligator, osprey, and possibly the southern panther.

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

In table 11, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

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

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

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

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

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

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

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine and cedar.

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the root zone, available water capacity, and soil moisture. Examples of shrubs are privet, huckleberry, yaupon, and mockorange.

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

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

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

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

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

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

Engineering

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

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

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

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

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

Building Site Development

Table 12 shows the degree and kind of soil limitations that affect shallow excavations, dwellings without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

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

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

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

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

Sanitary Facilities

Table 13 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 13 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

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

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if slope is excessive or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

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

Table 13 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, flooding, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope can cause construction problems.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 13 are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, slope, and flooding affect both types of landfill. Texture, highly organic layers, soil reaction, and content of sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

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

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 14 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

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

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

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

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential or slopes of 15 to 25 percent. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 14, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

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

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

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

Water Management

Table 15 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

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

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

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

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

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding and subsidence of organic layers. Excavating and grading and the stability of ditchbanks are affected by slope and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as sodium. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The performance of a system is affected by the depth of the root zone, the amount of sodium, and soil reaction.

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

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Wetness and slope affect the construction of grassed waterways. Low available water capacity, restricted rooting depth, toxic substances such as sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, water content, and bulk density. These results are reported in table 20.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 16 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

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

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (*4*) and the system adopted by the American Association of State Highway and Transportation Officials (*3*).

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

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

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

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

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

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

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

Physical and Chemical Properties

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

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth-moving operations.

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

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

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value the more susceptible the soil is to sheet and rill erosion by water.

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

In table 17, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

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

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary inundation of an area, is caused by overflowing streams or by runoff from adjacent slopes. Water standing for short periods after rainfall is not considered flooding, nor is water in swamps and marshes.

Table 18 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs, on the average, no more than twice in 5 years; and *frequent* that it occurs, on the average, more than twice in 5 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-June, for example, means that flooding can occur during the period November through June.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 18 are the depth to the seasonal high water table; the kind of water table—that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 18.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

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

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Evaluation of the soil's fertility requires consideration of the quantities of available plant nutrient elements as indicated by soil tests or plant tissue analyses. Special consideration is also given to other soil chemical characteristics that might have a detrimental effect on plant growth. During the fieldwork for this survey, samples were collected from each horizon, to a depth of at least 40 inches, at representative sites of most of the soils mapped. Among other tests, the samples were analyzed to determine the soil reaction; organic matter content; amount of extractable phosphorus (P); content of exchangeable cations of calcium (Ca), magnesium (Mg), potassium (K), sodium (Na), aluminum (A1), and hydrogen (H); extractable acidity; cation-exchange capacity; base saturation; and the saturation of A1 and Na. The results from these analyses, given in table 19, are the basis for the discussion in this section. These results can be especially useful in evaluating possible effects of practices that often result in material from subsurface horizons being incorporated into the surface layer. Such practices include ditching, terracing, land leveling, and levee construction.

Soil Fertility

Bobby J. Miller, Department of Agronomy, Agricultural Experiment Station, Louisiana State University, helped prepare this section.

Soil fertility commonly refers to the available plant nutrients in the soil together with other chemical conditions that influence the growth of plants.

The fertility level is one of the major factors determining a soil's potential for crop production. The natural fertility level is a reflection of the soil's inherent capacity to supply the nutrients required by plants and to provide a favorable chemical environment for roots of plants. Plant nutrient deficiencies as well as excessive quantities of some elements may limit yields of crops grown on some soils in Morehouse Parish.

Evaluation of the soil's fertility requires consideration of the quantities of available plant nutrient elements as indicated by soil tests or plant tissue analyses. Special consideration is also given to other soil chemical characteristics that might have a detrimental effect on plant growth. During the fieldwork for this survey, samples were collected from each horizon, to a depth of at least 40 inches, at representative sites of most of the soils mapped. Among other tests, the samples were analyzed to determine the soil reaction; organic matter content; amount of extractable phosphorus (P); content of exchangeable cations of calcium (Ca), magnesium (Mg), potassium (K), sodium (Na), aluminum (Al), hydrogen (H); extractable acidity; cation-exchange capacity; base saturation; and the saturation of Al and Na. The results from these analyses, given in table 19, are the basis for the discussion of this section. These results can be especially useful in evaluating possible effects of practices that often result in material from subsurface horizons being incorporated into the surface layer. Such practices include ditching, terracing, land leveling, and levee construction.

Soil fertility management and other soil management programs in the area are, with few exceptions, based on chemical and physical alteration of the surface horizon or plow layer. Characteristics of this horizon may be extremely variable from one place to another, depending on past management practices and soil use. In this section, however, emphasis is placed on characteristics of the horizons below the plow layer. Subsurface horizons are less subject to change, or change very slowly, as a result of alteration of the plow layer. Fertility levels and other chemical characteristics of the surface horizon can be essentially eliminated as limiting factors in plant growth under management systems that include adequate soil testing and fertility maintenance programs. Under these conditions, physical characteristics of the plow layer and physical and chemical characteristics of the lower horizons are the soil factors that may limit plant growth and consequently limit crop yields under normal management practices.

The actual quantity of a nutrient element present as well as the relative quantity of other elements present are important considerations in evaluating a soil's fertility. The soil's *cation exchange capacity* is a measure of its ability to adsorb positively charged ions, or *extractable cations,* of such elements as Ca, Mg, K, Na, A1, and H. Thus, larger quantities of an element such as Ca are required to give a higher saturation of extractable Ca in a soil horizon with a high cation-exchange capacity than in one in which the capacity to adsorb cations is low. Louisiana Agricultural Experiment Station publications (*7, 28*) contain additional information about these factors as well as the guidelines (*28*) used for the various nutrient levels.

The level of a soil's cation-exchange capacity is almost entirely the result of the amount and kind of clay present and the *organic matter content.* Some soils, such as Perry and Portland soils, contain large amounts of clay throughout and have a high cation-exchange capacity. In contrast, soils such as Haggerty soils contain relatively small amounts of clay and have a much lower cation-exchange capacity. Many of the soils in the parish have subsoil horizons that are more clayey than the surface horizon. As a result, they frequently have a greater cation-exchange capacity in the subsoil than in the surface horizon. The cation-exchange capacity in the Gallion soils, for example, is 11.2 milliequivalents per 100 grams of soil in the surface layer and as high as 29.4 milliequivalents per 100 grams of soil in the subsoil. Organic matter also tends to produce a high cation-exchange capacity. The Allemands soil, an organic soil (Histosol), has the highest cation-exchange capacity (75.6 milliequivalents per 100 grams) measured in any soil in the parish. Many other soils have a higher cation-exchange capacity in the surface horizon than in the next lower horizon even though the clay content of the two horizons may be similar. This can be attributed in large part to a higher organic matter content in the surface horizon.

The soils were analyzed to determine the quantities of the nutrient elements present in terms of extractable cations. The distribution pattern of these elements in the profiles of the soils, as shown in table 19, indicates that weathering of minerals, decomposition of organic matter, and other possible natural sources of nutrient elements do not maintain high P, Ca, Mg, and K levels in the surface layer and in the upper horizon of the subsoil. In most of these soils the higher levels of Ca, P, and K in surface layers can be largely attributed to fertilizer and lime applications. Nutrients accumulated in organic matter and released through its decomposition may also contribute to this distribution pattern. These processes, however, have not maintained higher levels of Mg in surface layers than in subsoil horizons in most of the soils.

A cation-exchange capacity that is 85 to 100 percent saturated with bases (Ca, Mg, K, Na) is best for most agricultural purposes. Very few of the soils in the parish have a *base saturation* this high in any horizon. The relative amounts of the different bases present can be equally important. In general 60 to 80 percent saturation with Ca, 10 to 20 percent with Mg, 2 to 5 percent saturation with K, and less than 2 percent saturation with Na are considered favorable for most uses. Excessive quantities of any one element, especially Na, can be detrimental.

The soils analyzed in Morehouse Parish can be placed in four general groups according to the levels of *extractable P* in horizons below the surface horizon. Only the Dexter, Gallion, Hebert, Mer Rouge, Perry, Portland, Rilla, Sterlington, and Yorktown soils have as much as 100 parts per million (ppm) extractable P in any soil horizon. The Allemands soil has between 50 and 100 ppm extractable P in one or more horizons. Soils with one or more subsoil horizons having between 25 and 50 ppm extractable P are the Cascilla, Forestdale, Goodwill, and Litro soils. In the remaining soils, the maximum extractable P levels are less than 25 ppm in all subsoil horizons analyzed.

The relative amounts of extractable Na and Al are given in terms of the percent *Na saturation* and percent *Al saturation*. Excessive quantities of extractable Na are present within the normal depth of rooting of most crops in the Lafe soils. Some horizons have more than 15 percent of the cation-exchange capacity saturated with extractable Na. In almost all years, crops grown on these soils can be expected to produce lower yields than those grown on associated soils that do not have the high Na levels. The Forestdale, Guyton, Groom, Tillou, and Wrightsville soils in the parish typically have relatively high levels of extractable Na, but at a greater depth than the Lafe soils. Problems resulting from the relatively high levels of extractable Na in these soils are less severe than in the Lafe soils. They are most pronounced during dry years and on deep-rooting perennial or summer-growing annual plants. Other soils that, at some location and typically at even greater depths, may have relatively high levels of extractable Na include the Bussy soils, Libuse soils, Rilla soils, and possibly others. High levels of Na in these soils, however, are typically at too great a depth to significantly influence the growth of plants in most years.

At relatively shallow depths, the reduced yields may result from one or more of the detrimental effects associated with large quantities of Na (*6*). The Na reduces soil aggregation; as a result, the permeability of the soil to air and water is decreased. Consequently, these soils dry more slowly than associated soils. This is particularly apparent early in spring after they have become saturated during the wet winter months. Once these soils are dry, the recharge of moisture from rainfall during the growing season is slower than in associated soils. Plants growing on these soils may suffer drought stress.

High Na levels may also inhibit or interfere with the plant's uptake of other nutrients such as Ca and Mg. On the other hand, some plants take up quantities of Na large enough to have a detrimental effect. Where high Na levels are associated with high alkalinity, there is a caustic effect to some plants as well as possible toxic effects from anions such as the bicarbonate associated with large quantities of Na. The high alkalinity may also result in reduced availability to the plant of many nutrient elements. If the soil contains large enough quantities of soluble salts, some plants may suffer physiologic drought caused by osmotic movement of water from the plant to the soil.

Three important characteristics of the soils that have high levels of extractable Na are indicated by the data in table 19. First, the high levels of Na are mainly in subsoil horizons. The Lafe soils typically have high Na levels below a depth of about 10 to 20 inches. Second, soils that contain relatively large quantities of Na in the upper or middle parts of the solum also have relatively large quantities of Na in the lower part. This indicates a hazard from incorporating subsoil material into the surface layer, for example, in land smoothing or spreading spoil (soil material taken from excavations for structures such as building foundations, roadways, drainage ditches, and other works). Finally, a neutral or alkaline soil reaction (soil pH 6.6 or greater) is not a reliable indicator of a high content of extractable Na. Some soils, such as the Groom soils, have high levels of extractable Na in horizons that are quite acid.

In some areas, particularly in arid regions, large quantities of extractable Na are typically associated with alkaline soil reactions. In Morehouse Parish, some of the soils that have relatively high Na levels in the subsoil have pH values of less than 5.0. These soils have a neutral or alkaline reaction, however, at some depth in or below the solum.

High levels of extractable Na are somewhat unusual in soils developed in parent materials that are possibly 20,000 or more years old in a humid, subtropical climate such as that which characterizes Morehouse Parish. The source of the Na in these soils has not been established. Neither have satisfactory and economical methods been devised to improve the soils for agriculture.

The quantities and percent saturation of extractable Al are also given in table 19. Quantities of extractable aluminum (Al) that are potentially toxic to some plants are present in some horizons of mineral soils having pH values of less than about 5.5. High levels of extractable Al can be toxic to many cultivars of crops such as cotton, soybeans, corn, and small grains (*1, 2, 12, 13, 19, 20*). A greater than 10 percent saturation of the soil's effective cation-exchange capacity with extractable Al may result in Al toxicity to some crops. The effective cation-exchange capacity of the soil is the sum of the extractable Ca, Mg, K, Na, Al, and H. This should not be confused with the cation-exchange capacity shown in table 19, which is the sum of the extractable Ca, Mg, K, Na, and extractable acidity. Potentially toxic levels of extractable Al were present in surface as well as subsoil horizons of many of the soils analyzed. Of the soils analyzed, only the Forestdale, Gallion, Idee, Lafe, Mer Rouge, and Perry soils had less than 10 percent saturation with extractable Al in all horizons.

Important relationships exist between saturation with extractable Al and other properties of mineral soils. First, extractable Al rather than H is the dominant form of the exchangeable acidity in most horizons. The term exchangeable acidity, as used here, should not be confused with extractable acidity, which is the sum of the acidity that can be chemically removed from the soil at pH 8.0. Second, potentially toxic levels of Al are typically present in soil horizons that have pH 5.0 or less and in some that have pH 5.1 to 5.5. Third, the percent saturation with extractable Al generally decreases with increasing organic matter content. Thus, surface layers are commonly less saturated with extractable Al than subsoil horizons having comparable pH values. The amounts of extractable Al typically increase with increasing clay content in horizons having comparable soil reactions and the percent saturation increases as the soil becomes more acid than about pH 5.5. Consequently, the greatest saturation with extractable Al is generally in the first or second subsoil horizon below the plow layer with decreasing saturation at greater depths. The kinds of clay minerals in the soil can also influence the quantities of extractable Al present.

The complex relationships between extractable Al and other soil properties indicate that actual measurement of the extractable Al present is the only reliable indicator of Al levels in acid mineral soils having soil pH 5.5 or less (*23, 24*). Potentially toxic levels of extractable Al have not been found in soils having higher pH values.

Soil treatments or other cultural methods that reduce or avoid problems associated with high levels of extractable Al have not been thoroughly studied in Louisiana. Liming soil horizons to pH values above 5.5 is probably the most widespread method of reducing extractable Al levels (*5, 9, 15, 16, 27, 29, 30*). There is a wide range of susceptibility to Al phytotoxicity among many agronomic crops depending, in some cases, on the particular cultivar grown. Planting crops or cultivars that are tolerant of high Al levels can help avoid phytotoxicity problems.

Manganese (Mn) is another essential plant nutrient element that may be present in amounts that are toxic to plants in many acid, poorly drained soils. Mn is somewhat analogous to Al in that potentially toxic levels are most common in soil horizons that have a pH 5.0 to 5.5 or less. Increasing the pH of the soil to pH 6.0 or more reduces Mn solubility to nontoxic levels. Unlike Al, Mn can occur as either the oxidized or reduced form in soils. The more soluble reduced form of Mn is more prevalent in wet, poorly drained or somewhat poorly drained soils than in associated soils that are better drained. Also, potentially toxic levels in surface horizons are more common for Mn than Al. Toxicity from high levels of Mn is more common in wet years than dry years.

The following are the methods used by the Soil Fertility Laboratory of the Louisiana Agricultural Experiment Station. The codes in parentheses refer to published methods (*41*).

Organic carbon—dichromate, ferric sulfate titration (6A1a).
Organic matter—peroxide digestion (6A3).
Extractable cations—ammonium acetate pH 7.0, uncorrected; calcium (6N2), magnesium (602), sodium (6P2), potassium (6Q2).
Extractable acidity—barium chloride-triethanolamine I (6H1a).
Cation-exchange capacity—sum of cations (5A3a).
Base saturation—sum of cations, TEA, pH 8.2 (5C3).
Reaction (pH)—1:1 water dilution (8C1a).
Aluminum—potassium chloride extraction (6G).
Available phosphorus—(Bray's weak extracting solution).

Physical and Chemical Analyses of Selected Soils

The results of physical analyses of several typical pedons in the survey area are given in table 20 and the results of additional chemical analyses are in table 21. The mineral composition of the clay fraction of these pedons is given in table 22. The data are for soils sampled at carefully selected sites. The pedons are typical of the series and are described in the section "Soil Series and Their Morphology." Soil samples were analyzed by the National Soil Survey Laboratory, Soil Conservation Service, and by the Soil Characterization Laboratory, Louisiana Agricultural Experiment Station.

Most determinations, except those for grain-size analysis and bulk density, were made on soil material smaller than 2 millimeters in diameter. Measurements reported as percent or quantity of unit weight were calculated on an oven-dry basis. The methods used by the National Soil Survey Laboratory and the Soil Characterization Laboratory are indicated in the list that follows. The codes in parentheses refer to published methods (*41*).

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

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

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

Water retained—pressure extraction, percentage of oven-dry weight of less than 2 mm material; 1/3 or 1/10 (3/10) bar (4B1), 15 bars (4B2).

Moist bulk density—of less than 2 mm material, saran-coated clods (4A1).

Organic carbon—dichromate, ferric sulfate titration (6A1a).

Extractable cations—ammonium acetate pH 7.0, uncorrected; calcium (6N2), magnesium (602), sodium (6P2), potassium (6Q2).

Extractable acidity—barium chloride-triethanolamine I (6H1a).

Cation-exchange capacity—ammonium acetate, pH 7.0 (5A1b).

Base saturation—ammonium acetate, pH 7.0 (5C1).

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

Reaction (pH)—potassium chloride (8C1c).

Reaction (pH)—calcium chloride (8C1e).

Aluminum—potassium chloride extraction (6G).

Iron—dithionate-citrate extract (6C2b).

Available phosphorus—(Bray No. 1 and No. 2).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*43*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 23 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Alfisol.

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

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludalfs (*Hapl*, meaning minimal horizonation, plus *udalf*, the suborder of the Alfisols that have an udic moisture regime).

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

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-silty, mixed, thermic, Typic Hapludalfs.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the Soil Survey Manual (*40*). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (*43*). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Allemands Series

The Allemands series consists of poorly drained, very slowly permeable organic soils. These soils formed in moderately thick accumulations of decomposed organic material over semifluid, clayey alluvium deposited by the Mississippi and Arkansas Rivers. They are in rim swamps and former stream channels on the flood plain near Coulee Bayou. The soils are artificially drained, but subject to rare flooding. Slope ranges from 0 to 1 percent.

The soils of the Allemands series are clayey, montmorillonitic, euic, thermic Terric Medisaprists.

Allemands soils commonly are near Hebert, Perry, and Udalfs soils. The Hebert and Perry soils are on higher positions on the flood plain and are mineral soils. The Udalfs soils are strongly sloping mineral soils on escarpments of the adjacent uplands.

Typical pedon of Allemands muck, drained, 3 miles north of Mer Rouge, 2,640 feet east of parish road 6703, 42 feet south of drainage ditch; SE1/4NW1/4, sec. 12, T. 21 N., R. 6 E.

Oa1—0 to 6 inches; black (10YR 2/1) muck; about 2 percent fiber, about 1 percent rubbed; weak coarse subangular blocky structure parting to weak medium and fine granular; friable, nonsticky; few fine roots; about 40 percent mineral material; about 10 percent wood fragments; strongly acid; abrupt smooth boundary.

Oa2—6 to 18 inches; dark brown (7.5YR 3/2) and black (10YR 2/1) muck; very dark gray (10YR 3/1) pressed and rubbed; about 25 percent fiber, about 1 percent rubbed; weak coarse subangular blocky structure; friable; few fine roots; about 15 percent mineral material; about 15 percent wood fragments; extremely acid; clear wavy boundary.

Oa3—18 to 30 inches; very dark grayish brown (10YR 3/2) muck; about 20 percent black (10YR 2/1) muck; very dark brown (10YR 2/2) pressed and rubbed; about 30 percent fiber, about 1 percent rubbed; massive; friable; about 25 percent mineral material; about 20 percent wood fragments; extremely acid; gradual wavy boundary.

Oa4—30 to 36 inches; black (10YR 2/1) muck; about 10 percent fiber, about 1 percent rubbed; weak medium and fine granular structure; firm; about 20 percent mineral material; about 10 percent wood fragments; extremely acid; abrupt smooth boundary.

IICg—36 to 65 inches; gray (5Y 5/1) clay; massive; squeezes with difficulty between fingers leaving residue in hand; extremely acid.

The depth to clayey mineral layers ranges from 16 to 51 inches. Reaction of the organic layers ranges from extremely acid to strongly acid, except in surface layers that have been limed. Reaction of the IICg horizon ranges from extremely acid to slightly acid.

The organic layers have hue of 10YR or 7.5YR, value of 2 to 4, and chroma of 1 or 2. Mineral content ranges from about 15 to 40 percent by weight. The fiber content ranges from 5 to 40 percent unrubbed and from 1 to 10 percent after rubbing. The organic material consists dominantly of well decomposed herbaceous plant remains. The content of wood fragments, consisting of undecomposed logs, roots, and stumps, ranges from 5 to 20 percent.

The IICg horizon has hue of 5Y or 5GY, value of 4 or 5, chroma of 1. It is clay or silty clay.

Bussy Series

The Bussy series consists of moderately well drained, slowly permeable soils that have a fragipan. These soils formed in loess on terrace uplands. Slope ranges from 1 to 8 percent.

The soils of the Bussy series are fine-silty, siliceous, thermic Typic Fragiudalfs.

Bussy soils are similar to Libuse soils and commonly are near Debute, Frizzell, Guyton, and Tillou soils. The Debute soils are on side slopes along major drainageways and have a redder subsoil. The somewhat poorly drained Frizzell and Tillou soils are less sloping than Bussy soils and do not have a fragipan. The poorly drained Guyton soils are along the drainageways and do not have a fragipan. The Libuse soils are in similar positions and contain more sand in the fragipan subsoil.

Typical pedon of Bussy silt loam, 1 to 5 percent slopes, 13 miles northeast of Bastrop, 90 feet east of Georgia-Pacific gravel road, 21 feet north of woods road; NW1/4SE1/4, sec. 15, T. 23 N., R. 6 E.

A1—O to 4 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; friable; common fine and medium roots; few fine black concretions; strongly acid; clear smooth boundary.

B1—4 to 9 inches; yellowish brown (10YR 5/4) silt loam; common medium faint dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; friable; common fine and medium roots; few fine black concretions; very strongly acid; gradual smooth boundary.

B21t—9 to 15 inches; yellowish brown (10YR 5/6) silt loam; weak medium subangular blocky structure; very friable; common fine and medium roots; thin patchy clay films on faces of peds; few fine black concretions; very strongly acid; clear smooth boundary.

B22t—15 to 22 inches; yellowish brown (10YR 5/6) silt loam; few fine distinct strong brown mottles; weak medium subangular blocky structure; friable; common fine and medium roots; common thick discontinuous clay films on faces of peds; few fine medium black concretions; very strongly acid; clear smooth boundary.

B23t—22 to 35 inches; yellowish brown (10YR 5/4) silt loam; common medium faint light yellowish brown (10YR 6/4) and few fine prominent yellowish red mottles; light yellowish brown (10YR 6/4) silt coats surround most peds; moderate medium subangular blocky structure; friable; common fine and medium roots between peds; common very fine pores; thin patchy clay films on faces of peds; few fine black concretions; very strongly acid; clear wavy boundary.

Bx1—35 to 45 inches; yellowish brown (10YR 5/6) silt loam, common medium faint dark yellowish brown

(10YR 4/4) mottles; moderate coarse prismatic structure parting to weak medium subangular blocky; firm and brittle; common very fine and fine roots between peds; common very fine pores; thin patchy clay films on faces of peds; cracks between prisms are filled with light brownish gray (10YR 6/2) silt loam; common fine and medium black concretions; strongly acid; gradual wavy boundary.

Bx2—45 to 56 inches; yellowish brown (10YR 5/6) silty clay loam; moderate coarse prismatic structure parting to weak medium subangular blocky; firm and brittle; common very fine pores; thin discontinuous clay films on faces of peds; light brownish gray (10YR 6/2) silt loam l/2 inch to 2 inches wide between the prisms; common fine and medium black concretions; strongly acid; clear smooth boundary.

Bx3—56 to 65 inches; yellowish brown (10YR 5/6) silt loam; common medium faint light brownish gray (10YR 6/2) mottles; moderate coarse prismastic structure parting to weak medium subangular blocky; firm and slightly brittle; few thin patchy clay films; medium acid.

The thickness of the solum ranges from 60 to 100 inches or more. Depth to the fragipan ranges from 24 to 40 inches. Reaction is mainly very strongly acid or strongly acid throughout, except in surface layers that have been limed. In places the lower part of the fragipan is medium acid. The effective cation-exchange capacity of this soil is 50 percent or more saturated with exchangeable aluminum in the control section to a depth of 30 inches or more.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4. Texture is silt loam. The B1, where present, has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 through 8.

The B1 horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It is mottled in shades of red, brown, and yellow. Texture is silt loam or silty clay loam.

The Bx horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. Mottles are in shades of gray, yellow, or brown. Texture is silt loam or silty clay loam.

Cascilla Series

The Cascilla series consists of well drained, moderately permeable soils. These soils formed in loamy alluvium. The soils are on natural levees of major drainageways that drain terrace uplands. Slope ranges from 0 to 2 percent.

The soils of the Cascilla series are fine-silty, mixed, thermic Fluventic Dystrochrepts.

Cascilla soils commonly are near the Frizzell, Guyton, Libuse, Perry, Portland, and Tillou soils. The somewhat poorly drained Guyton soils are in lower positions. The well drained Libuse soils are in higher, more sloping positions and have a fragipan. The Perry and Portland soils are in lower positions and are more clayey throughout.

Typical pedon of Cascilla silt loam, in an area of Guyton-Cascilla complex, frequently flooded, 1 mile north of Beekman school, 63 feet east of center of gravel road at 2nd bridge on south bank of creek; NE1/4SW1/4, sec. 32, T. 23 N., R. 6 E.

Ap—0 to 7 inches; dark brown (10YR 4/3) silt loam; common medium faint brown (10YR 5/3) mottles; moderate medium subangular blocky structure; friable; common fine and medium roots; very strongly acid; clear smooth boundary.

B1—7 to 13 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; very friable; few fine and medium roots; very strongly acid; clear smooth boundary.

B21—13 to 24 inches; dark yellowish brown (10YR 4/4) silt loam; few fine faint brown mottles; weak medium subangular blocky structure; friable; few fine and medium roots; few thin patchy clay films on a few faces of peds; very strongly acid; clear smooth boundary.

B22—24 to 40 inches; dark brown (10YR 4/3) silt loam; many medium faint brown (10YR 5/3) and few fine faint light brownish gray mottles; moderate medium subangular blocky structure; friable; few medium roots; few thin patchy clay films on faces of peds; very strongly acid; clear smooth boundary.

B3—40 to 60 inches; dark yellowish brown (10YR 4/4) silt loam; common medium faint pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; friable; few medium roots; very strongly acid.

The thickness of the solum ranges from 45 to 80 inches. The effective cation-exchange capacity of this soil is 50 percent or more saturated with exchangeable aluminum in the control section to a depth of 30 inches or more. The soil is strongly acid or very strongly acid throughout, except where the surface layer has been limed.

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

The B1, B2, and B3 horizons have hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. Mottles are in shades of brown and gray. The gray mottles are mainly at depths of 24 inches or more below the soil surface.

Debute Series

The Debute series consists of moderately well drained, slowly permeable soils that have a fragipan. These soils formed in a thin mantle of loess over loamy sediments. The soils are on terrace uplands. Slope ranges from 1 to 8 percent.

The soils of the Debute series are fine-silty, mixed, thermic Typic Fragiudults.

Debute soils are similar to Libuse soils and commonly are near Bussy, Frizzell, Guyton, Perry, Rilla, and Tillou soils. The moderately well drained Bussy and Libuse soils and the somewhat poorly drained Frizzell and Tillou soils are in higher positions than the Debute soils. The poorly drained Guyton soils are along the drainageways. The poorly drained, clayey Perry soils and the well drained, loamy Rilla soils are in lower positions.

Typical pedon of Debute silt loam, 3 to 8 percent slopes, about 8 miles north of Bastrop, 974 feet south of Pratt Brake, 0.9 mile north of Georgia-Pacific gravel road, 36 feet east of steep bank of AL&M railroad; SE1/4NE1/4, sec. 7, T. 22 N., R. 6 E.

A11—0 to 2 inches; dark brown (10YR 4/3) silt loam; weak medium subangular blocky structure; very friable; common fine roots; common black organic stains on faces of peds; medium acid; clear smooth boundary.

A12—2 to 8 inches; dark brown (10YR 4/3) silt loam; common medium faint dark brown (7.5YR 4/4) mottles; weak medium subangular blocky structure; friable; common very fine and medium roots and few very coarse roots; acid; clear wavy boundary.

B21t—8 to 18 inches; yellowish red (5YR 4/6) silt loam; weak medium subangular blocky structure; friable; common very fine, medium, and coarse roots; common thin patchy clay films on faces of peds; few fine black concretions; strongly acid; clear smooth boundary.

B22t—18 to 27 inches; yellowish red (5YR 4/6) silty clay loam; moderate medium subangular blocky structure; about 70 percent of the horizontal cross section is friable and about 30 percent is firm and brittle; common very fine, fine, and medium roots; common thin patchy clay films on faces of peds; few medium soft brown masses; common black stains on faces of peds; very strongly acid; clear smooth boundary.

IIBx1—27 to 37 inches; reddish brown (5YR 4/4) silt loam, light brown (7.5YR 6/4) between prisms; moderate very coarse prismatic structure parting to moderate medium subangular blocky; about 70 percent of mass is firm and brittle and about 30 percent is friable; common fine and medium roots; common very fine pores; common distinct clay films on faces of peds and in pores; common black stains on faces of peds; strongly acid; clear wavy boundary.

IIBx2—37 to 53 inches; reddish brown (2.5YR 4/4) loam; common medium prominent light yellowish brown (10YR 6/4) streaks, pockets, and coatings between prisms; moderate very coarse prismatic structure parting to moderate medium subangular blocky; about 70 percent of mass is firm and brittle and about 30 percent is friable; common fine roots between peds; distinct clay films on faces of peds; common black stains on faces of peds; strongly acid; clear wavy boundary.

IIBx3—53 to 70 inches; red (2.5YR 4/6) loam; few medium prominent light yellowish brown (10YR 6/4) fine sandy loam streaks and coatings about peds; moderate coarse subangular blocky structure; about 50 percent of the horizontal cross section is firm and brittle sand about 50 percent friable; few medium roots between prisms; common distinct clay films on faces of peds; strongly acid; clear wavy boundary.

IIB23t—70 to 90 inches; red (2.5YR 4/6) sandy clay loam; common medium prominent light gray (10YR 6/1) mottles; weak coarse subangular blocky structure; about 80 percent of mass is friable and about 20 percent is firm and brittle; thin patchy clay films on faces of peds and in pores; light gray (10YR 7/1) fine sandy loam and very firm sandy loam between peds; very strongly acid.

The thickness of the solum ranges from about 50 to 100 inches. Depth to the fragipan ranges from 20 to 40 inches. Reaction, except for surfaces that have been limed, ranges from medium acid to very strongly acid throughout the solum. The effective cation-exchange capacity is 20 to 50 percent saturated with exchangeable aluminum to a depth of 30 inches or more.

The A horizon has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 2 to 4. It ranges in thickness from 2 to 13 inches.

The B2t horizon has hue of 5YR or 2.5YR, value of 4 to 5, and chroma of 4 to 8. Mottles are in shades of yellow and brown. Texture is silt loam or silty clay loam.

The IIBx and IIB2t horizons have hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 4 or 6. Mottles are in shades of gray, yellow, and brown. Texture is silt loam, loam, or sandy clay loam.

Dexter Series

The Dexter series consists of well drained, moderately permeable soils. These soils formed in loess overlying loamy braided stream deposits of the Arkansas River. The soils are on long, narrow, convex ridges that parallel the Boeuf River. Slope ranges from 3 to 5 percent.

The soils of the Dexter series are fine-silty, mixed, thermic Ultic Hapludalfs.

Dexter soils commonly are near Goodwill and Idee soils. Goodwill and Idee soils are in lower positions and have yellower subsoils.

Typical pedon of Dexter silt loam, 3 to 5 percent slopes, 9.5 miles southeast of Mer Rouge, 1,320 feet east of property line and 165 feet north of turn row; SW1/4NW1/4, sec. 28, T. 20 N., R. 8 E.

Ap1—0 to 2 inches; brown (10YR 4/3) silt loam; few fine faint dark brown mottles; weak medium granular structure; very friable; many fine roots; strongly acid; clear smooth boundary.

Ap2—2 to 7 inches; yellowish brown (10YR 5/4) silt loam; few fine faint strong brown mottles; weak medium subangular blocky structure; friable; common fine roots; common fine pores; few soft black masses; medium acid; abrupt smooth boundary.

B21t—7 to 14 inches; dark brown (7.5YR 4/4) silt loam; common medium distinct yellowish red (5YR 4/6) mottles on faces of peds; few fine distinct light yellowish brown mottles; moderate medium subangular blocky structure; friable; common fine roots; common fine pores; thin almost continuous clay films; few patchy black stains on peds; medium acid; clear smooth boundary.

B22t—14 to 28 inches; reddish brown (5YR 4/4) silty clay loam; faces of peds are yellowish red (5YR 4/6); moderate fine and medium subangular blocky structure; friable; few fine roots; thick almost continuous clay films; few black stains on some peds; few soft black masses; strongly acid; clear smooth boundary.

B23t—28 to 48 inches; yellowish red (5YR 4/6) clay loam; weak medium subangular blocky structure; friable; few fine roots; common thin patchy clay films; few small black conceretions; few patchy black stains on peds; some peds slightly brittle; strongly acid; clear smooth boundary.

IIB3—48 to 59 inches; dark brown (7.5YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; few sand grains bridged with clay; few black stains on peds; medium acid; clear smooth boundary.

IIC—59 to 87 inches; dark brown (7.5YR 4/4) loamy fine sand; single grained; very friable; medium acid.

The thickness of the solum ranges from 34 to 60 inches. Base saturation is greater than 35 percent at a depth of 50 inches below the upper boundary of the argillic horizon.

The A horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. The thickness ranges from 4 to 10 inches. Reaction typically ranges from strongly acid to slightly acid, but it is neutral in places where it has been limed.

The Bt horizon has hue of 7.5YR or 5YR, value of 4 and 5, and chroma of 4 to 6. It is silt loam, silty clay loam, or clay loam. Reaction ranges from very strongly acid to medium acid.

The IIB3 horizon has colors similar to the Bt horizon. Texture is fine sandy loam, loam, or clay loam. Reaction ranges from very strongly acid to medium acid.

The IIC horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 6. Reaction ranges from very strongly acid to medium acid.

Forestdale Series

The Forestdale series consists of poorly drained, very slowly permeable soils. These soils formed in clayey and silty alluvium or in alluvium that is mixed with loess. They are on broad, nearly level and depressional areas on the flood plains of the Boeuf River. Slope ranges from 0 to 1 percent.

The soils of the Forestdale series are fine, montmorillonitic, thermic Typic Ochraqualfs.

Forestdale soils are similar to Idee and Hebert soils and commonly are near Dexter, Goodwill, Perry, and Portland soils. The Dexter, Goodwill, Idee, and Hebert soils are more loamy throughout and are in slightly higher positions. Perry and Portland soils contain more clay and are in positions similar to those of the Forestdale soils.

Typical pedon of Forestdale silty clay loam, about 7 miles northeast of Oak Ridge, 1 mile east of Moss Brake, 60 feet east of Turkey Bayou, 90 feet north of parish road 5540; SW1/4SW1/4, sec. 4, T. 19 N., R. 8 E.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silty clay loam; weak medium subangular blocky structure; friable; common fine roots; medium acid; abrupt smooth boundary.

B2tg—6 to 27 inches; light gray (10YR 6/1) silty clay; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky strcture; firm; few fine roots; few thick continuous clay films on faces of peds; few fine brown concretions; strongly acid; clear smooth boundary.

B31g—27 to 35 inches; light gray (10YR 6/1) silty clay loam; many medium distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; few medium and fine roots; thin patchy clay films; common fine brown concretions; medium acid; clear smooth boundary.

B32g—35 to 60 inches; light brownish gray (10YR 6/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; friable; few medium roots; thin patchy clay films; many medium black and brown masses and concretions; slightly acid.

The thickness of the solum ranges from 40 to more than 60 inches. Base saturation is greater than 60 percent at a depth of 50 inches below the upper boundary of the B horizon.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 or less. It is 4 to 8 inches thick. Reaction ranges from very strongly acid to medium acid, except in places where it has been limed.

The B2tg horizon has hue of 10YR or 2.5Y, value of 4 to 6 and chroma of 1 or 2. Few to many mottles in shades of brown and yellow are in this horizon. It is silty clay loam, silty clay, or clay. Reaction ranges from very strongly acid to medium acid.

The B3g horizon has colors similar to those of the B2tg horizon. It is silt loam, clay loam, or silty clay loam. Reaction ranges from strongly acid to mildly alkaline.

Frizzell Series

The Frizzell series consists of somewhat poorly drained, slowly permeable soils. These soils formed in mixed loess and loamy alluvium. The soils are on the terrace uplands. Slope ranges from 0 to 1 percent.

The soils of the Frizzell series are coarse-silty, siliceous, thermic Glossaquic Hapludalfs.

Frizzell soils commonly are near Guyton, Libuse, and Wrightsville soils. The Guyton and Wrightsville soils are in lower positions and are more poorly drained than the Frizzell soils. The moderately well drained Libuse soils are on side slopes and ridgetops and have a fragipan.

Typical pedon of Frizzell silt loam, about 13 miles north of Bastrop, 279 feet east of intersection of Highway 142 and parish road 2250, 51 feet north of gravel road; SE1/4NW1/4, sec. 14, T. 23 N., R. 5 E.

A1—0 to 4 inches; dark brown (10YR 4/3) silt loam; common partially decayed leaves, pine needles, and small twigs in the upper part of the horizon; few fine faint yellowish brown mottles; weak medium subangular blocky structure; friable; many fine roots; few fine pores; strongly acid; clear wavy boundary.

B&A21—4 to 25 inches; light yellowish brown (10YR 6/4) silt loam (B); 15 percent light brownish gray (10YR 6/2) silt loam (A2); common medium faint brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable; common fine roots; common fine and very fine pores; interfingers of A2 material 1/2 inch in width extend through this horizon; common fine black concretions; few hard brown concretions; common soft brown masses; very strongly acid; clear irregular boundary.

B&A22—25 to 48 inches; pale brown (10YR 6/3) silt loam (B); 10 percent light brownish gray (10YR 6/2) silt loam (A2); common medium faint yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; friable; few fine roots; few fine pores; some interfingers of A2 material 1/2 inch in width extend to a depth of 48 inches; common fine and medium black concretions; few fine brown concretions; strongly acid; clear wavy boundary.

B21t—48 to 54 inches; yellowish brown (10YR 5/4) silty clay loam; few fine faint gray and light brownish gray mottles; moderate medium subangular blocky structure; firm; few fine roots; common fine pores; common fine and medium black concretions; common soft medium and coarse brown masses; common thin patchy clay films; common fine and medium pockets of light gray silt loam; strongly acid; clear wavy boundary.

B22t—54 to 76 inches; yellowish brown (10YR 5/4) silt loam; many medium distinct light brownish gray (10YR 6/2), and few medium distinct gray (10YR 5/1) mottles; weak medium subangular blocky structure; friable; few patchy clay films; common fine and coarse black and brown masses; strongly acid.

The thickness of the solum ranges from 60 to 80 inches. Base saturation is greater than 35 percent at a depth of 50 inches below the upper boundary of the argillic horizon. The soil is very strongly acid or strongly acid throughout, except where limed. The effective cation-exchange capacity of this soil is 50 percent or more saturated with exchangeable aluminum in the control section to a depth of 30 inches or more.

The A1 horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. It is 2 to 4 inches thick.

The B part of the B&A horizon has hue of 10YR, value of 5 or 6, and chroma of 3 to 6. It is silt loam or loam. Common to many mottles are in shades of gray or brown.

The A part of the B&A horizon has hue of 10YR, value of 5 to 7, and chroma of 1 to 3. It is silt or silt loam and contains less clay than the B part of the B&A horizon.

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

Gallion Series

The Gallion series consists of well drained, moderately permeable soils. These soils formed in loamy alluvium deposited by the Arkansas River. These soils are on natural levees bordering the Bayou Bonne Idee, Coulee Bayou, and other former channels and distributaries of the Arkansas River. Slope ranges from 0 to 2 percent.

The soils of the Gallion series are fine-silty, mixed, thermic Typic Hapludalfs.

Gallion soils commonly are near Hebert, Mer Rouge, Perry, Portland, Rilla, and Sterlington soils. The Hebert soils are in lower positions and are more poorly drained. Mer Rouge soils are in similar positions and have thick, darker surface and upper subsoil layers. Perry and Portland soils are in lower positions and are more clayey. Rilla and Sterlington soils are in higher positions and are more acid.

Typical pedon of Gallion silt loam, 5 miles north of Mer Rouge, 102 feet south of canal and 75 feet east of property line; NW1/4SW1/4, sec. 32, T. 22 N., R. 7 E.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam; weak medium subangular blocky structure; very friable; common fine and medium roots; medium acid; abrupt smooth boundary.

B21t—7 to 19 inches; brown (7.5YR 5/4) silty clay loam; moderate medium subangular blocky structure; friable; few fine and medium roots; few thin patchy clay films; few medium black concretions; slightly acid; clear smooth boundary.

B22t—19 to 27 inches; brown (7.5YR 5/4) silt loam; weak medium subangular blocky structure; friable; few fine and medium roots; thin patchy clay films; common medium to very coarse concretions of calcium carbonate; moderately alkaline; clear smooth boundary.

B3—27 to 38 inches; brown (7.5YR 5/4) silt loam; few fine faint strong brown mottles; weak medium subangular blocky structure; very friable; few fine roots; few fine black concretions; moderately alkaline; clear smooth boundary.

C—38 to 60 inches; brown (7.5YR 5/4) silt loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; very friable; common fine to very coarse concretions of calcium carbonate; moderately alkaline.

The thickness of the solum ranges from about 40 to 60 inches. Base saturation is greater than 80 percent at a depth of 50 inches below the upper boundary of the B horizon.

The Ap horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 or 3. It is 4 to 12 inches thick and ranges from medium acid to neutral. Texture is silt loam or silty clay loam.

The Bt horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. It is silt loam, clay loam, or silty clay loam and ranges from medium acid to moderately alkaline.

The B3 horizon has color and textures similar to the Bt horizon. Some pedons also have textures of very fine sandy loam, loam, and clay loam. Reaction ranges from slightly acid to moderately alkaline. Concretions of calcium carbonate commonly are in the B3 horizon.

The C horizon has colors and textures similar to the B3 horizon. Concretions of calcium carbonate commonly are in this horizon. Reaction ranges from neutral to moderately alkaline.

Goodwill Series

The Goodwill series consists of well drained, moderately permeable soils that formed in mixed alluvium and loess overlying loamy braided stream deposits of the Arkansas River. These soils are on the flood plains between Bayou Bonne Idee and the Boeuf River. Slope dominantly ranges from 1 to 3 percent, but ranges to as much as 5 percent in places.

The soils of the Goodwill series are fine-silty, mixed, thermic Ultic Hapludalfs.

Goodwill soils commonly are near Dexter, Forestdale, Hebert, Idee, and Perry soils. Dexter soils are in higher positions and have a redder subsoil. Forestdale and Perry soils are in lower positions and have a clayey control section. Idee and Hebert soils are more poorly drained and are in lower positions.

Typical pedon of Goodwill silt loam, in an area of Idee-Goodwill complex, about 10.5 miles southeast of Mer Rouge, 3,400 feet east of center of parish road 5605, 52 feet east of natural drain, 18 feet north of fence line; SW1/4SE1/4, sec. 22, T. 20 N., R. 8 E.

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

B21t—5 to 9 inches; brown (10YR 5/3) silt loam; common medium faint brown (7.5YR 4/4) mottles; weak medium subangular blocky structure; friable; common very fine roots; thin patchy clay films on faces of peds; few fine brown concretions; very strongly acid; gradual wavy boundary.

B22t—9 to 18 inches; brown (10YR 5/3) silty clay loam; common medium faint brown (7.5YR 4/4) mottles; weak coarse subangular blocky structure parting to moderate medium subangular blocky; firm; few fine roots; few fine pores; thin distinct discontinuous clay films on faces of peds and in pores; common medium and fine black and brown concretions; very strongly acid; gradual wavy boundary.

B23t—18 to 28 inches; brown (10YR 5/3) silt loam; many coarse faint brown (7.5YR 4/4) mottles; weak medium subangular blocky structure; friable; few very fine roots; thin patchy clay films on faces of peds; few medium and coarse brown and black concretions; very strongly acid; gradual wavy boundary.

IIB24t—28 to 42 inches; yellowish brown (10YR 5/6) and brown (7.5YR 4/4) loam; vertical streaks, 1 to 3 centimeters in diameter of light brownish gray (10YR 6/2) silty clay loam make up about 30 percent of the horizon; weak coarse prismatic structure parting to weak medium subangular blocky; yellowish brown and light brownish gray material is friable and brown material is firm and brittle; few fine roots; thin patchy clay films on faces of peds; few fine pores; few fine black and brown concretions; very strongly acid; gradual wavy boundary.

IIB25t—42 to 56 inches; brown (7.5YR 4/4) fine sandy loam; common medium faint brown (7.5YR 5/4) mottles; few streaks and pockets of grayish brown (10YR 5/2) and light brownish gray (10YR 6/2) loamy fine sand; weak coarse subangular blocky structure; friable; few very fine roots; thin patchy clay films on faces of peds; few fine pores; very strongly acid; clear smooth boundary.

IIB3—56 to 72 inches; dark yellowish brown (10YR 4/4) fine sandy loam; common medium distinct grayish brown (10YR 5/2) and light brownish gray (10YR 6/2) streaks and mottles; weak medium subangular blocky structure; friable; few fine roots; very strongly acid.

The thickness of the solum ranges from 60 to 80 inches or more. Base saturation is greater than 45 percent at a depth of 50 inches below the upper boundary of the B horizon.

The Ap or A1 horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. It is 4 to 7 inches thick and ranges from very strongly acid to medium acid, except where limed.

The Bt horizon has hue of 10YR, value of 4 or 5, and chroma of 3 to 6. Mottles in shades of yellow, gray, and brown range from none to many. Texture is silt loam, clay loam, loam, or silty clay loam. Reaction ranges from very strongly acid to medium acid.

The IIBt horizon has hue of 5YR, 7.5YR, or 10YR; value of 4 to 6; and chroma of 3 to 6. It is fine sandy loam, silt loam, or loam. Reaction ranges from very strongly acid to slightly acid.

Groom Series

The Groom series consists of poorly drained, moderately slowly permeable soils. These soils formed in loamy alluvium or mixed loess and loamy alluvium. They are on low stream terraces. Slope is dominantly less than 1 percent.

The soils of the Groom series are fine-silty, siliceous, thermic Aeric Ochraqualfs.

Groom soils commonly are near Guyton, Litro, Mollicy, Perry, Portland, and Wrightsville soils. Guyton soils are in local drainageways and are grayer throughout than Groom soils. Litro, Perry, and Portland soils are in lower positions and are more clayey throughout. The somewhat poorly drained Mollicy soils are on low ridges. Wrightsville soils are in similar positions and contain more clay in the subsoil.

Typical pedon of Groom very fine sandy loam, 9 miles northwest of Bastrop, 246 feet east of north-south field road, 57 feet south of east-west field road; NW1/4NW1/4, sec. 27, T. 22 N., R. 4 E.

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) very fine sandy loam; weak medium subangular blocky structure; friable; few fine and very fine roots; neutral; abrupt smooth boundary.

B1g—5 to 12 inches; gray (10YR 6/1) loam; many medium distinct dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; friable; few very fine roots; extremely acid; gradual wavy boundary.

B21tg—12 to 26 inches; gray (10YR 6/1) silt loam; many medium distinct yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/4) mottles; moderate medium subangular blocky structure; friable; few very fine roots in upper part; thin patchy clay films on faces of most peds; extremely acid; gradual wavy boundary.

B22t—26 to 33 inches; yellowish brown (10YR 5/6) silt loam; many coarse dstinct gray (10YR 6/1) mottles; weak medium subangular blocky structure; friable; thin patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

B23tg—33 to 48 inches; gray (10YR 5/1) silty clay loam; common medium distinct dark yellowish brown (10YR 4/4) mottles; weak coarse subangular blocky structure; firm; few cup-shaped clay bands 2 to 5 millimeters thick; thin patchy clay films; few medium and coarse concretions of iron-manganese; few pockets of calcium sulfate crystals 1 to 3 millimeters in diameter; extremely acid; gradual wavy boundary.

B24tg—48 to 78 inches; gray (10YR 5/1) silty clay loam; many coarse distinct brown (7.5YR 5/4) mottles; weak medium subangular blocky structure; firm; few cup-shaped clay bands 2 to 5 millimeters thick; thin patchy clay films; few fine brown and black concretions of iron-manganese; common black stains and black masses; few pockets of white calcium sulfate crystals; extremely acid.

The thickness of the solum ranges from 60 to 90 inches or more. Reaction ranges from extremely acid to strongly acid throughout, except where the soil has been limed. Plow layers that have been limed have a reaction ranging from medium acid to neutral. The effective cation-exchange capacity is 50 to 90 percent saturated with exchangeable aluminum in the control section to a depth of about 30 inches or more. Exchangeable sodium percentage ranges from about 10 to 40 percent below a depth of 40 inches.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 2 or 3. It is 3 to 8 inches thick. Texture is very fine sandy loam or silt loam.

The B1 horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. Mottles in shades of brown range from few to many. It is silt loam, loam, or very fine sandy loam.

The B21t horizon has the same color range as the B1 horizon. It is silt loam, loam, or silty clay loam.

The B22t horizon has hue of 10YR, value of 5 or 6, and chroma of 3 to 6. Mottles in shades of gray and brown range from few to many. It is silty clay loam, loam, or silt loam.

The B23t and B24t horizons have hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. Mottles in shades of brown and yellow range from few to many. It is silty clay loam, loam, or silt loam.

Guyton Series

The Guyton series consists of poorly drained, slowly permeable soils. These soils formed in loamy alluvium. They are on broad, level and slightly depressional areas on terrace uplands and on the flood plains of streams draining terrace uplands. Slope is less than 1 percent.

The soils of the Guyton series are fine-silty, siliceous, thermic Typic Glossaqualfs.

Guyton soils are closely associated with Bussy, Cascilla, Frizzell, Libuse, Perry, Portland, and Tillou soils. The moderately well drained Bussy and Libuse soils are in higher positions and have a fragipan. The well drained Cascilla soils are on narrow, natural levees along stream channels. The somewhat poorly drained Frizzell and Tillou soils are in higher positions. The Perry and Portland soils are in similar positions and are more clayey throughout.

Typical pedon of Guyton silt loam, 1 mile north of Beekman, 195 feet northwest of bridge on gravel road, 51 feet northeast of center of gravel road; NW1/4SW1/4, sec. 32, T. 23 N., R. 6 E.

A1—0 to 6 inches; brown (10YR 4/3) silt loam; weak medium subangular blocky structure; friable; many fine and medium roots; very strongly acid; clear smooth boundary.

A21g—6 to 13 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; friable; few fine and medium roots; few medium brown concretions; very strongly acid; clear wavy boundary.

A22g—13 to 23 inches; light brownish gray (10YR 6/2) silt loam; few fine distinct yellowish brown mottles; weak medium subangular blocky structure; friable; few fine roots; few fine pores; few fine and medium brown concretions; very strongly acid; clear irregular boundary.

B&A—23 to 32 inches; grayish brown (10YR 5/2) silt loam (B); few fine faint yellowish brown and brown mottles; moderate medium subangular blocky structure; friable; few small roots; thin patchy clay films on faces of peds; few medium and fine brown concretions; few medium soft black masses; tongues of light grayish brown (10YR 6/2) silt loam (A) from 1/2 inch to 2 inches in width make up about 20 percent of the horizon; strongly acid; clear wavy boundary.

B22tg—32 to 42 inches; grayish brown (10YR 5/2) silty clay loam; few medium faint yellowish brown (10YR 5/4) mottles; moderate medium subangular blocky structure; firm; common fine and very fine pores; few thin patchy clay films on faces of peds and in pores; few thin light gray (10YR 7/2) silt coats between some peds; common fine, medium, and coarse black and brown concretions; strongly acid; clear smooth boundary.

B3g—42 to 60 inches; light brownish gray (10YR 6/2) silt loam; many medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; few thin patchy clay films on faces of most peds; few fine and very fine black and brown concretions; strongly acid.

The thickness of the solum ranges from 50 to 80 inches. Base saturation is greater than 35 percent at a depth of 50 inches below the upper boundary of the B horizon. The effective cation-exchange capacity of this soil is 50 percent or more saturated with exchangeable aluminum in the control section to a depth of 30 inches or more.

The A1 or Ap horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 or 3. It is 3 to 8 inches thick and ranges from very strongly acid to medium acid, except where limed.

The A2g horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Mottles, in shades of brown or gray, range from few to many. Texture is silt loam or loam. Reaction ranges from very strongly acid to medium acid.

The B part of the B&A horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. It is silty clay loam or silt loam with few to common mottles in shades of brown and gray. It is extremely acid to medium acid.

The A part of the B&A horizon has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 1 or 2. It is silt loam, and contains less clay than the B part of the B&A horizon. Reaction ranges from very strongly acid to medium acid.

The B2tg horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. It is silty clay loam, silt loam, or loam and ranges from very strongly acid to medium acid.

The B3g horizon has colors and textures similar to the B2tg horizon. It ranges from very strongly acid in the upper part to neutral in the lower part of the horizon.

Haggerty Series

The Haggerty series consists of somewhat poorly drained, moderately rapidly permeable soils. These soils formed in loamy and sandy sediments. They are on low stream terraces and old lake beaches within the flood plains of the Ouachita River. Slope is dominantly less than 1 percent, but ranges to as much as 2 percent.

The soils of the Haggerty series are coarse-loamy, siliceous, thermic Aeric Ochraqults.

Haggerty soils are near Groom, Litro, Mollicy, and Perry soils. Groom and Mollicy soils are in slightly higher positions and contain more clay in the subsoil. Litro and

Perry soils are in lower positions and are more clayey throughout.

Typical pedon of Haggerty loamy fine sand, 11 miles northwest of Bastrop, 100 feet north of center of field road and 2,870 feet west of southeast corner; SE1/4SW1/4, sec. 16, T. 22 N., R. 4 E.

A1—0 to 9 inches; pale brown (10YR 6/3) loamy fine sand; common medium faint light yellowish brown (10YR 6/4) mottles; weak medium granular structure; very friable; common fine roots; few fine pores; very strongly acid; clear smooth boundary.

B21t—9 to 14 inches; light brownish gray (10YR 6/2) fine sandy loam; many fine distinct yellowish brown mottles; weak medium subangular blocky structure; friable; common fine and medium roots; few fine pores; sand grains coated and bridged with clay; strong brown (7.5YR 4/6) stains around pores and abandoned root channels; very strongly acid; clear wavy boundary.

B22t—14 to 20 inches; yellowish brown (10YR 5/4) fine sandy loam; many medium distinct light brownish gray (10YR 6/2) and strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; many fine and medium roots; common fine pores; thin patchy clay films and common clay bridging between sand grains; extremely acid; clear wavy boundary.

B31—20 to 30 inches; light brownish gray (10YR 6/2) fine sandy loam; many coarse distinct yellowish brown (10YR 5/6) and few fine distinct strong brown mottles; weak medium subangular blocky structure; friable; few very fine and fine roots; few very fine and fine pores; clay bridging between sand grains; fine black stains on faces of peds; extremely acid; clear wavy boundary.

B32—30 to 40 inches; light brownish gray (10YR 6/2) loamy fine sand; common medium distinct light yellowish brown (10YR 6/4) and yellowish brown (10YR 5/4) mottles; few medium prominent strong brown (7.5YR 5/6) masses of fine sandy loam; weak medium subangular blocky structure; very friable; few very fine roots; few medium to coarse firm brittle bodies; extremely acid; abrupt wavy boundary.

C—40 to 60 inches; light gray (10YR 6/1) sand; few fine faint pale brown and few fine distinct yellowish brown mottles; single grained; loose; very strongly acid.

The thickness of the solum ranges from 25 to 55 inches. Reaction ranges from extremely acid to strongly acid throughout, except where the soil has been limed. The effective cation-exchange capacity of this soil is 50 percent or more saturated with exchangeable aluminum in the control section to a depth of 30 inches or more. Content of gravel ranges from 0 to 5 percent in the lower B and IIC horizons.

The A horizon has hue of 10YR, value of 3 to 6, and chroma of 2 to 4. Where the value is 3, thickness is 6 inches or less. The A horizon is loamy fine sand or silty clay.

The upper part of the B2t horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. Texture of all B horizons is fine sandy loam or loamy fine sand with less than 18 percent clay. The lower part of the B2t horizon has hue of 10YR, value of 4 or 6, and chroma of 3 to 6. Mottles are in shades of gray, brown, or red.

The B3 horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. Mottles are in shades of brown or red.

The C horizon has hue of 10YR, value of 6 to 8, and chroma of 1 or 2. Mottles are in shades of brown. Texture is sand, fine sand, or loamy fine sand.

Hebert Series

The Hebert series consists of somewhat poorly drained, moderately slowly permeable soils. These soils formed in loamy alluvium deposited by the Arkansas River. They are on broad flats and backslopes of natural levees bordering Bayou Bartholomew, Bayou Bonne Idee, and other former channels and distributaries of the old Arkansas River. Slope is dominantly less than 1 percent, but ranges to as much as 3 percent.

The soils of the Hebert series are fine-silty, mixed, thermic Aeric Ochraqualfs.

Hebert soils are similar to Idee soils and commonly are near Mer Rouge, Perry, Portland, Rilla, and Sterlington soils. The Idee soils are on low terraces of the Mississippi River and have a yellower subsoil. Mer Rouge soils are in similar positions and have a darker surface layer. The poorly drained Perry soils and somewhat poorly drained Portland soils are in lower positions and are more clayey throughout. The well drained Rilla and Sterlington soils are in higher positions on natural levees.

Typical pedon of Hebert silt loam, about 6 miles northeast of Mer Rouge, Louisiana, 399 feet east of Morehouse Parish Road 6021, 15 feet south of field road; SE1/4SE1/4, sec. 13, T. 21 N., R. 7 E.

Ap—0 to 6 inches; brown (10YR 4/3) silt loam; weak medium subangular blocky structure; very friable; few very fine and fine roots; few fine brown concretions; neutral; abrupt smooth boundary.

A2—6 to 15 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct dark yellowish brown (10YR 4/4) mottles; weak medium subangular blocky structure; friable; few very fine and fine roots; few fine black concretions; very strongly acid; clear wavy boundary.

B21t—15 to 22 inches; reddish gray (5YR 5/2) loam; light gray (10YR 7/1) silt coatings on faces of peds; common medium prominent light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; friable; few very fine and fine roots; few thin patchy clay films; few fine black concretions; very strongly acid; clear wavy boundary.

B22t—22 to 34 inches; reddish brown (5YR 5/3) silty clay loam; few light gray (10YR 7/1) silt coatings on faces of peds; common medium distinct brown (7.5YR 4/4) mottles; moderate medium subangular blocky structure; firm; few fine roots; common patchy clay films; few fine black concretions; very strongly acid; clear wavy boundary.

B3—34 to 44 inches; reddish brown (5YR 4/4) silt loam; few fine prominent light brownish gray mottles; weak medium subangular blocky structure; firm; few thin patchy clay films on faces of some peds; few medium black stains; strongly acid; gradual wavy boundary.

C—44 to 60 inches; stratified reddish brown (5YR 4/4) silty clay loam and reddish brown (5YR 5/3) silt loam; massive; silty clay loam material is firm and silt loam material is friable; common medium black stains; medium acid.

Thickness of the solum ranges from 36 to 72 inches. The effective cation-exchange capacity is 20 to 50 percent saturated with exchangeable aluminum to a depth of 30 inches or more.

The A1 or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. It is 4 to 10 inches thick and ranges from strongly acid to neutral. The A1 horizon is silt loam or silty clay loam.

The A2 horizon has hue of 10YR, value of 5 to 7, and chroma of 1 to 3. It is silt loam, loam, or very fine sandy loam. Reaction ranges from very strongly acid to neutral.

The B horizon has hue of 10YR, 7.5YR, and 5YR; value of 4 to 6; and chroma of 2 to 4. It is silty clay loam, silt loam, or loam and ranges from very strongly acid to slightly acid.

The C horizon has the same color range as the B horizon. Texture is silt loam, silty clay loam, or very fine sandy loam. Reaction ranges from strongly acid to mildly alkaline.

Idee Series

The Idee series consists of somewhat poorly drained, moderately slowly permeable soils that formed in mixed alluvium and loess overlying loamy braided stream deposits of the Arkansas River. These soils are on the flood plains between Bayou Bonne Idee and the Boeuf River. Slope is dominantly less than 1 percent, but it ranges to as much as 3 percent.

The soils of the Idee series are fine-silty, mixed, thermic Aeric Ochraqualfs.

Idee soils commonly are near Dexter, Forestdale, Goodwill, Hebert, and Perry soils. Dexter and Goodwill soils are well drained and are in higher positions. Forestdale soils are poorly drained and are in lower positions. Hebert soils are in similar positions and have hue of 5YR or 7.5YR in the B2t horizon. Perry soils are in lower positions and are more clayey throughout.

Typical pedon of Idee silt loam, in an area of Idee-Goodwill complex, about 9.5 miles southeast of Mer Rouge, 180 feet east of center of parish road 5605, 12 feet north of fence; NW1/4NW1/4, sec. 15, T. 20 N., R. 8 E.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam; weak medium subangular blocky structure parting to weak medium and fine granular; friable; common fine roots; very strongly acid; abrupt smooth boundary.

B21t—6 to 16 inches; grayish brown (10YR 5/2) silt loam; many medium and coarse distinct yellowish brown (10YR 5/4) mottles; weak coarse subangular blocky structure; friable; few fine roots; thin patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

B22t—16 to 34 inches; grayish brown (10YR 5/2) silty clay loam; many coarse distinct brown (7.5YR 4/4) mottles; weak medium subangular blocky structure; firm; few fine roots; thin discontinuous clay films on faces of peds; few dark gray (10YR 4/1) clay flows in channels; few black masses; strongly acid; clear wavy boundary.

B23t—34 to 44 inches; grayish brown (10YR 5/2) silty clay loam; many coarse distinct dark yellowish brown (10YR 4/4) mottles; weak coarse subangular blocky structure; firm; few fine roots; distinct discontinuous clay films on faces of peds; few random dark gray (10YR 4/1) clay flows in channels; common medium and coarse black accumulations that are firm and brittle; few white crystals of barite; medium acid; clear wavy boundary.

IIB24tb—44 to 56 inches; yellowish brown (10YR 5/6) silt loam; many medium distinct grayish brown (10YR 5/2) mottles; weak coarse prismatic structure parting to weak medium subangular blocky; firm, slightly brittle; few fine roots; few fine pores; distinct discontinuous clay films; many black stains and accumulations; medium acid; gradual wavy boundary.

IIB25tb—56 to 70 inches; dark brown (7.5YR 4/4) loam; streaks and pockets of brown (7.5YR 5/2); weak very coarse subangular blocky structure; firm and brittle; few fine pores; thin patchy clay films; few black stains; slightly acid.

The thickness of the solum ranges from 40 to 60 inches or more. The A and B2t horizons range from extremely acid to slightly acid, except in surface layers that have been limed. The IIBt horizon ranges from strongly acid to slightly acid.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. Mottles are in shades of gray, yellow, or brown. The A horizon is silt loam or silty clay loam.

The B2t horizon has hue of 10YR, value of 4 to 6, and chroma of 2. Mottles are in shades of gray, yellow, or brown. Texture is silt loam or silty clay loam.

The IIBtb horizon has hue of 10YR and 7.5YR, value of 4 to 6, and chroma of 2 to 6. Mottles are in shades of gray, yellow, and brown. Texture is very fine sandy loam, silt loam, fine sandy loam, sandy clay loam, loam, or silty clay loam.

Lafe Series

The Lafe series consists of somewhat poorly drained, very slowly permeable soils. These soils formed in mixed loess and loamy alluvium. They are on low stream terraces of the Ouachita River. Slope ranges from 0 to 1 percent.

The soils of the Lafe series are fine-silty, mixed, thermic Glossic Natrudalfs.

Lafe soils are similar to Tillou soils and commonly are near Frizzell, Guyton, Libuse, and Wrightsville soils. None of these soils has a natric horizon. The somewhat poorly drained Frizzell soils and the poorly drained Wrightsville soils are in positions similar to those of the Lafe soils. The poorly drained Guyton soils are in similar positions and in drainageways. The moderately well drained Libuse soils and the somewhat poorly drained Tillou soils are on terrace uplands.

Typical pedon of Lafe silt loam, on an electrical powerline right-of-way, 33 feet south of gravel road, 108 feet northwest of intersection; SW1/4NE1/4, sec. 21, T. 23 N., R. 5 E.

A1—0 to 4 inches; grayish brown (10YR 5/2) silt loam; common medium distinct pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; very friable; many fine and very fine roots; medium acid; clear wavy boundary.

A2—4 to 12 inches; grayish brown (10YR 5/2) silt loam; few fine distinct yellowish brown mottles; weak medium subangular blocky structure; friable; common fine and very fine roots; common fine pores; few fine black concretions; neutral; clear irregular boundary.

B21t—12 to 25 inches; brown (10YR 5/3) silt loam; common medium distinct yellowish brown (10YR 5/4) mottles; moderate medium and coarse angular blocky structure parting to moderate medium subangular blocky; friable; tongues of light grayish brown silt loam that are 15 millimeters thick extend into this horizon; few medium and fine roots; common fine to coarse black concretions; common thin patchy clay films on faces of peds; strongly alkaline; clear wavy boundary.

B22t—25 to 36 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; common fine pores; common thin discontinuous clay films; common fine to coarse black concretions; strongly alkaline; clear wavy boundary.

B23t—36 to 50 inches; yellowish brown (10YR 5/4) silty clay loam; few fine faint light brownish gray mottles; moderate medium subangular blocky structure; friable; few fine and very fine pores; common fine to coarse black concretions; few thin discontinuous clay films; strongly alkaline; clear wavy boundary.

C—50 to 70 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct yellowish brown (10YR 5/4) mottles; massive; firm; common fine to coarse black concretions; few fine to coarse concretions of calcium carbonate; strongly alkaline.

Solum thickness ranges from 30 to 50 inches. Depth to horizons with sodium saturation of 15 percent or more ranges from 3 to 12 inches.

The A1 horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3. It ranges from strongly acid to slightly acid. Thickness ranges from 3 to 6 inches.

Most pedons have an A2 horizon. It has hue of 10YR, value of 5, and chroma of 1 or 2. Mottles are in shades of brown and gray. Reaction ranges from strongly acid to neutral.

The B2t has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. Mottles are in shades of brown and gray. Texture is silt loam or silty clay loam. Reaction is mildly alkaline or strongly alkaline.

The C horizon has colors similar to the B2t horizon. Texture is silt loam, silty clay loam, or fine sandy loam. Reaction is moderately alkaline or strongly alkaline.

Libuse Series

The Libuse series consists of moderately well drained, slowly permeable soils that have a fragipan. These soils formed in mixed loess and loamy sediments on terrace uplands. Slope ranges from 1 to 5 percent.

The soils of the Libuse series are fine-silty, siliceous, thermic Typic Fragiudalfs.

Libuse soils commonly are near Debute, Frizzell, and Guyton soils. The Debute soils are in similar positions and have a redder subsoil. The somewhat poorly drained Frizzell soils are on areas that are more level. The poorly drained Guyton soils are in drainageways and depressional areas.

Typical pedon of Libuse silt loam, 1 to 3 percent slopes, 12 miles north of Bastrop, 865 feet north of gravel road intersection, 120 feet east of gravel road; NW1/4NE1/4, sec. 21, T. 23 N., R. 5 E.

A1—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; weak medium subangular blocky and weak fine granular structure; friable; common fine and medium roots; medium acid; clear smooth boundary.

B1—4 to 7 inches; yellowish brown (10YR 5/4) silt loam; common fine distinct brown mottles; weak medium subangular blocky structure; friable; common fine roots; strongly acid; clear smooth boundary.

B21t—7 to 20 inches; strong brown (7.5YR 5/6) silt loam; few medium distinct brown (7.5YR 5/4) mottles; weak medium subangular blocky structure; friable; thin patchy clay films; few fine roots; strongly acid; clear smooth boundary.

B22t—20 to 27 inches; strong brown (7.5YR 5/6) silt loam; few medium distinct yellowish brown (10YR 5/4) and few medium distinct reddish brown (5YR 5/4) mottles; weak medium and coarse subangular blocky structure; friable; few fine roots; few fine pores; thin patchy clay films; strongly acid; clear wavy boundary.

Bx1—27 to 40 inches; yellowish brown (10YR 5/6) silt loam; few medium distinct pale brown (10YR 6/3) and few fine distinct light grayish brown mottles; strong coarse prismatic structure; firm and brittle; common fine pores; cracks between prisms filled with gray (10YR 5/1) silt loam (1 cm thick); thin distinct discontinuous clay films on faces of prisms; few fine roots between prisms; few fine brown and black concretions; strongly acid; gradual wavy boundary.

Bx2—40 to 51 inches; yellowish brown (10YR 5/6) silt loam; few medium faint dark yellowish brown (10YR 4/6) and few medium distinct gray (10YR 6/1) mottles; moderate coarse prismatic structure; about 80 percent of horizon is firm and brittle; cracks between prisms filled with gray (10YR 5/1) silt loam (1 to 2 cm thick); few fine roots between peds; few fine pores; thin distinct discontinuous clay films on faces of peds; few fine black concretions; strongly acid; gradual wavy boundary.

Bx3—51 to 60 inches; yellowish brown (10YR 5/6) silt loam; common medium distinct red (2.5YR 4/6) mottles; strong coarse prismatic structure; firm and brittle; gray (10YR 5/1) silty clay loam between peds; thin discontinuous clay films on faces of peds and in pores; common fine spheroidal pores inside peds; strongly acid; gradual wavy boundary.

B3—60 to 70 inches; yellowish brown (10YR 5/6) silt loam; common medium distinct gray (10YR 6/1) and common medium prominent light reddish brown (2.5YR 6/4) mottles; weak coarse prismatic structure; firm and slightly brittle; few fine roots between peds; gray (10YR 5/1) seams between peds; thin patchy clay films on faces of peds; very strongly acid.

The thickness of the solum ranges from 60 to 90 inches. Depth to the fragipan ranges from 18 to 36 inches. The effective cation-exchange capacity of this soil is 50 percent or more saturated with exchangeable aluminum in the control section to a depth of 30 inches or more.

The A1 or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. It is 3 to 8 inches thick and ranges from strongly acid to slightly acid, except in areas where limed.

The B1 horizon has hue of 10YR, value of 4 or 5, and chroma of 3 to 6. It is strongly acid or medium acid.

The B2t horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. It is silt loam or silty clay loam and ranges from very strongly acid to medium acid.

The Bx horizon has colors, textures, and a reaction similar to the B2t horizon. It is mottled in shades of gray, yellow, brown, or red. Typically, the sand content is greater in the fragipan.

The B3 horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. It is silt loam, loam, or sandy clay loam. Reaction ranges from very strongly acid to medium acid.

Litro Series

The Litro series consists of poorly drained, very slowly permeable soils. These soils formed in clayey alluvium. They are on the flood plains of the Ouachita River. Slope is dominantly less than 1 percent, but ranges from 0 to 2 percent.

The soils of the Litro series are fine, mixed, acid, thermic Vertic Haplaquepts.

The Litro soils commonly are near Groom, Haggerty, Mollicy, and Perry soils. The poorly drained Groom soils and the somewhat poorly drained Haggerty and Mollicy soils are in slightly higher positions. Perry soils are in similar positions and are more alkaline.

Typical pedon of Litro clay, 14 miles northwest of Bastrop, 0.2 mile north of drainage ditch, 500 feet northeast of Ouachita River, 24 feet east of woods road; SW1/4SW1/4, sec. 20, T. 23 N., R. 4 E.

A1—0 to 4 inches; dark gray (10YR 4/1) clay; moderate medium subangular blocky structure; firm; common very fine, fine, and medium roots; very strongly acid; clear smooth boundary.

B21g—4 to 14 inches; light gray (10YR 6/1) clay; common medium distinct strong brown (7.5YR 5/6) mottles; moderate fine and medium subangular blocky structure; firm; few fine and medium roots; few fine pores and root channels; very strongly acid; clear smooth boundary.

B22g—14 to 40 inches; gray (10YR 5/1) clay; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; few fine and medium roots; few very fine pores; very strongly acid; gradual wavy boundary.

B23g—40 to 70 inches; light brownish gray (10YR 6/2) clay; common medium distinct yellowish brown

(10YR 5/6) mottles; moderate medium subangular blocky structure; firm; few fine roots; acid.

The thickness of the solum is 60 to 100 inches. Reaction ranges from extremely acid to strongly acid throughout, except where the surface has been limed. The effective cation-exchange capacity is 50 to 90 percent saturated with exchangeable aluminum throughout the upper 30 inches of the control section.

The A1 horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It is 3 to 8 inches thick.

The B2g horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma 1 or 2. Mottles are in shades of brown and yellow. Texture is clay, silty clay, or silty clay loam.

A IIA horizon is in some pedons. Where present, it is below a depth of 30 inches and is silty clay, silty clay loam, very fine sandy loam, or loamy fine sand. It has hue of 10YR or 7.5YR, value of 3 to 6, and chroma of 2 to 4.

Mer Rouge Series

The Mer Rouge series consists of moderately well drained, moderately slowly permeable soils. These soils formed in loamy alluvium deposited by the Arkansas River. They are mainly on broad flats on the flood plains of Coulee Bayou and Bayou Bonne Idee. Slope ranges from 0 to 1 percent.

The soils of the Mer Rouge series are fine-silty, mixed, thermic Typic Argiudolls.

Mer Rouge soils commonly are near Gallion, Hebert, Perry, Portland, Rilla, and Sterlington soils. None of these soils has a mollic epipedon. The Gallion, Rilla, and Sterlington soils are in slightly higher positions. The Hebert, Perry, and Portland soils are in lower positions.

Typical pedon of Mer Rouge silt loam, 2-1/2 miles northeast of Collinston, 1,440 feet west of east section line and 174 feet north of south section line; SW1/4SE1/4, sec. 10, T. 20 N., R. 6 E.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam; weak medium subangular blocky structure; very friable; many fine roots; common very fine soft black nodules, neutral; clear smooth boundary.

B21t—7 to 18 inches; very dark brown (10YR 2/2) silt loam; weak very coarse prismatic structure parting to weak medium subangular blocky; friable; many fine pores; few patchy clay films; few soft black nodules; mildly alkaline; gradual wavy boundary.

B22t—18 to 26 inches; dark brown (10YR 4/3) silt loam that is about 40 percent very dark grayish brown (10YR 3/2) streaks; weak medium subangular blocky structure; friable; many fine pores; few patchy clay films; moderately alkaline; gradual wavy boundary.

B23t—26 to 32 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; few fine pores; few thin patchy clay films; few fine concretions of lime; calcareous matrix; moderately alkaline; clear smooth boundary.

B31—32 to 50 inches; yellowish brown (10YR 5/4) silt loam; few fine faint brown and few fine distinct strong brown mottles; weak medium subangular blocky structure; friable; few fine pores; few thin patchy clay films on vertical faces of peds; common fine pores; few concretions of lime 2 to 5 cm in diameter; calcareous matrix; moderately alkaline; clear smooth boundary.

B32—50 to 64 inches; brown (7.5YR 5/4) silt loam; common medium faint strong brown (7.5YR 5/6) and few medium distinct yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; friable; few medium concretions of lime; calcareous matrix; moderately alkaline.

The thickness of the solum ranges from 40 to 80 inches. Base saturation is greater than 80 percent at a depth of 50 inches below the upper boundary of the B horizon. Thickness of the mollic epipedon ranges from 12 to 24 inches.

The Ap horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 or 2. It is 4 to 10 inches thick and slightly acid or neutral. The Ap horizon is silt loam or silty clay loam.

The B2t horizon, within the mollic epipedon, has the same color range as the Ap horizon. It is silt loam, silty clay loam, or clay loam. Reaction ranges from slightly acid to moderately alkaline.

The B2t horizon below the mollic epipedon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. It is silty clay loam, clay loam, loam, very fine sandy loam, or silt loam. Reaction ranges from slightly acid to moderately alkaline.

The B3 horizon has the same color and reaction as the lower part of the B2t horizon. It is silt loam, loam, or very fine sandy loam.

Mollicy Series

The Mollicy series consists of somewhat poorly drained, moderately slowly permeable soils. These soils formed in loamy alluvium or in mixed loess and loamy alluvium. They are on low stream terraces. Slope is dominantly 1 to 3 percent, but ranges to as much as 5 percent.

The soils of the Mollicy series are fine-loamy, siliceous, thermic Aquic Hapludults.

Mollicy soils commonly are near the Groom, Guyton, Haggerty, Litro, Perry, Portland, and Wrightsville soils. The poorly drained Groom and Wrightsville soils are in level and concave positions. The poorly drained Guyton soils are in drainageways. The Haggerty soils are in lower positions and are more sandy throughout than

Mollicy soils. The Litro, Perry, and Portland soils are in lower positions and are more clayey.

Typical pedon of Mollicy loam, in an area of Groom-Mollicy complex, 8 miles northwest of Bastrop, 55 feet north of field road, 550 feet east of the southwest section corner; SW1/4SW1/4, sec. 23, T. 22 N., R. 4 E.

Ap—0 to 5 inches; brown (10YR 5/3) loam; few fine distinct grayish brown and yellowish brown mottles; platy structure parting to weak medium subangular blocky; friable; few fine, medium, and coarse roots; extremely acid; abrupt smooth boundary.

B21t—5 to 14 inches; yellowish brown (10YR 5/6 and 5/4) loam; common fine distinct grayish brown mottles; few medium prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; friable; few fine, medium, and coarse roots; thin patchy clay films; common very fine pores; few soft black masses; extremely acid; clear irregular boundary.

B22t—14 to 26 inches; grayish brown (10YR 5/2) clay loam; common medium prominent red (2.5YR 4/6) and common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; few fine, medium, and coarse roots; common fine pores; thin almost continuous clay films; few coarse black masses; extremely acid; clear wavy boundary.

B23t—26 to 34 inches; yellowish brown (10YR 5/4) clay loam; many medium prominent red (2.5YR 4/6) and many medium distinct gray (10YR 6/1) mottles; moderate medium angular blocky structure; firm; common fine pores; thin almost continuous clay films; common black masses; extremely acid; gradual wavy boundary.

IIB24t—34 to 46 inches; yellowish brown (10YR 5/6) and red (2.5YR 4/6) sandy clay loam; common medium distinct gray (10YR 6/1) mottles; moderate medium subangular blocky structure; firm; few fine pores; thick almost continuous clay films; extremely acid; gradual wavy boundary.

IIB31—46 to 62 inches; strong brown (7.5YR 5/6) fine sandy loam; common coarse distinct gray (10YR 5/1) mottles and common medium distinct yellowish red (5YR 4/6) mottles; weak coarse subangular blocky structure; firm; thin discontinuous clay films; extremely acid; gradual wavy boundary.

IIB32—62 to 76 inches; brown (7.5YR 5/4) fine sandy loam; common medium and coarse distinct gray (10YR 5/1) mottles; weak coarse subangular blocky structure; friable; few fine roots; extremely acid; gradual wavy boundary.

IIB33—76 to 90 inches; brown (7.5YR 5/4) fine sandy loam; common medium and coarse light gray (10YR 7/1) mottles and streaks and pockets of sand that make up about 30 percent of the horizon; weak coarse subangular blocky structure (sand is structureless); friable (sand is very friable); extremely acid.

The thickness of the solum is greater than 55 inches. It ranges from extremely acid to strongly acid, except where the soil has been limed. The effective cation-exchange capacity is 50 to 90 percent saturated with exchangeable aluminum in the control section, to a depth of 30 inches or more.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4. Where color value is 3, thickness is 6 inches or less. Texture is commonly loam, but it is silt loam in some pedons.

The B2t horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 2 to 6. Texture is sandy clay loam, loam, or fine sandy loam. The B2t horizon is mottled in shades of gray, yellow, and red.

The IIB horizon has hue of 10YR, 7.5YR, or 2.5YR; value of 4 to 6; and chroma of 4 to 6. It is clay loam, loam, or fine sandy loam. The IIB horizon is mottled in shades of gray, yellow, or red.

Perry Series

The Perry series consists of poorly drained, very slowly permeable soils. These soils formed in clayey alluvium deposited by the Arkansas River and possibly the Mississippi River. They are in backswamp areas on the flood plains of the Ouachita River, Bayou Bonne Idee, and other former channels and distributaries of the Arkansas River. Slope ranges from 0 to 3 percent.

The soils of the Perry series are very-fine, montmorillonitic, nonacid, thermic Vertic Haplaquepts.

Perry soils commonly are near the Forestdale, Gallion, Hebert, Idee, Litro, Mer Rouge, Portland, and Rilla soils. Forestdale soils are in slightly higher positions and contain less clay in the solum than do the Perry soils. Gallion, Hebert, Idee, and Rilla soils are in higher positions and are loamy throughout. Portland soils are in slightly higher positions and are redder throughout.

Typical pedon of Perry clay, 0 to 1 percent slopes, 10 miles northeast of Mer Rouge, 1,320 feet north of southwest corner of sec. 11, T. 21 N., R. 8 E.

Ap—0 to 6 inches; gray (10YR 5/1) clay; common medium distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; very firm; few fine roots; medium acid; abrupt smooth boundary.

B21g—6 to 19 inches; gray (10YR 5/1) clay; many medium distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; few fine roots; few slickensides 3 to 5 inches wide on 45-degree angle at bottom of horizon; strongly acid; clear smooth boundary.

B22g—19 to 30 inches; gray (10YR 5/1) clay; many medium distinct strong brown (7.5YR 4/6) and few medium prominent dark red (2.5YR 3/6) mottles; moderate medium subangular blocky structure; firm; few fine roots; common slickensides 3 to 5 inches wide on 45-degree angle; medium acid; clear wavy boundary.

IIB3—30 to 44 inches; dark reddish brown (5YR 3/4) clay; few fine distinct dark red (2.5YR 3/6) mottles; moderate medium subangular blocky structure; firm; few roots; many small concretions of lime; common slickensides 3 to 10 inches wide on 45-degree angle; mildly alkaline; clear smooth boundary.

IIC—44 to 60 inches; reddish brown (5YR 4/4) clay; few fine faint reddish brown mottles; moderate medium subangular blocky structure; firm; many concretions of carbonates; mildly alkaline.

The thickness of the solum ranges from 30 to 60 inches. Clay content ranges from 60 to 85 percent throughout.

The Ap horizon has hue of 10YR, value of 3 to 6, and chroma of 1 or 2. Reactions range from very strongly acid to medium acid. Thickness ranges from 4 to 9 inches.

The B2g horizon has hue of 10YR, value of 4 to 6, and chroma of 1. Mottles are in shades of red and brown. Texture is clay, and reaction ranges from strongly acid to neutral.

The IIB3 horizon has hue of 5YR, value of 3 or 4, and chroma of 2 to 4. Texture is clay, and reaction ranges from slightly acid to moderately alkaline.

The C horizon has hue of 10YR, 7.5YR, or 5YR; value of 4 or 5; and chroma of 1 to 4. It is calcareous and contains few to many concretions of carbonates.

Portland Series

The Portland series consists of somewhat poorly drained, very slowly permeable soils. These soils formed in clayey alluvium deposited by the Arkansas River. The soils are on flood plains mainly of the Ouachita River, Bayou Bonne Idee, and other former channels of the Arkansas River. Slope ranges from 0 to 2 percent.

The soils of the Portland series are very-fine, mixed, nonacid, thermic Vertic Haplaquepts.

Portland soils commonly are near Gallion, Hebert, Perry, Rilla, and Sterlington soils. The Gallion, Hebert, Rilla, and Sterlington soils are in higher positions and are loamy throughout. The Perry soils are in lower positions, are poorly drained, and are grayer throughout.

Typical pedon of Portland clay, 11 miles northeast of Bastrop, 570 feet east of bridge, 75 feet north of center of parish road 9202; NW1/4NE1/4, sec. 2, T. 22 N., R. 6 E.

A1—0 to 6 inches; brown (10YR 5/3) clay; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; firm, sticky; common fine and medium roots; medium acid; clear smooth boundary.

B21—6 to 16 inches; reddish brown (5YR 4/3) clay; few medium distinct grayish brown (10YR 5/2) and few medium prominent yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm, sticky; common medium roots; strongly acid; clear wavy boundary.

B22—16 to 27 inches; reddish brown (5YR 4/3) clay; moderate medium subangular blocky structure; firm; few fine roots; few black stains on faces of peds; neutral; clear wavy boundary.

B23—27 to 55 inches; reddish brown (5YR 4/3) clay; moderate medium subangular blocky structure; firm; few fine roots; common fine to coarse concretions of carbonates; few fine black masses; moderately alkaline; clear wavy boundary.

B24—55 to 65 inches; reddish brown (5YR 4/4) clay; moderate medium subangular blocky structure; firm; common fine to medium concretions of carbonates; common black stains on faces of peds; mildly alkaline.

The thickness of the solum ranges from 38 to 70 inches or more. Clay content ranges from 60 to 85 percent. The soil has cracks 1 to 2 inches wide extending to depths of 2 to 3 feet or more during some periods in most years.

The Ap horizon has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 2 or 3. It is 3 to 15 inches thick and strongly acid or very strongly acid, except where limed. Typically, the Ap horizon is clay, but it is silt loam in some pedons.

The B2 horizon has hue of 5YR or 7.5YR, value of 4, and chroma of 3 or 5. The upper part of the B2 horizon has some mottles of 2 chroma or less. It is clay or silty clay. Reaction ranges from very strongly acid to moderately alkaline.

Rilla Series

The Rilla series consists of well drained, moderately permeable soils. They formed in loamy alluvium deposited by the Arkansas River. These soils are on natural levees bordering Bayou Bonne Idee and other former channels and distributaries of the Arkansas River. Slope ranges from 0 to 3 percent.

The soils of the Rilla series are fine-silty, mixed, thermic Typic Hapludalfs.

Rilla soils commonly are near Gallion, Hebert, Perry, Portland, and Sterlington soils. The Hebert soils are in lower positions and are grayer throughout. The Gallion soils are in slightly lower positions and have a more alkaline subsoil. The Perry and Portland soils are in backswamp areas and are more clayey throughout. The Sterlington soils are in slightly higher positions and contain less clay in the subsoil.

Typical pedon of Rilla silt loam, 0 to 1 percent slopes, 6 miles northeast of Oak Ridge, 2,600 feet north of blacktop road, 100 feet east of Moss Brake; NE1/4SW1/4, sec. 5, T. 19 N., R. 8 E.

Ap—0 to 6 inches; brown (10YR 5/3) silt loam; weak medium subangular blocky structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

A2—6 to 10 inches; pale brown (10YR 6/3) silt loam; common medium faint yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; friable; few fine roots; very strongly acid; clear smooth boundary.

B21t—10 to 15 inches; strong brown (7.5YR 5/6) silt loam; moderate medium subangular blocky structure; friable; few fine roots; thin pale brown (10YR 6/3) silt coats on faces of peds; very strongly acid; clear smooth boundary.

B22t—15 to 28 inches; yellowish red (5YR 4/6) silty clay loam; moderate medium subangular blocky structure; firm; few fine roots; almost continuous clay films on faces of peds; thin pale brown (10YR 6/3) silt coats on faces of peds, along cracks, and in root channels; very strongly acid; clear smooth boundary.

B23t—28 to 41 inches; yellowish red (5YR 4/6) silt loam; moderate medium subangular blocky structure; friable; common thin patchy clay films on faces of peds; thin pale brown (10YR 6/3) silt coats on faces of peds, along cracks, and in root channels; few soft black masses; strongly acid; clear smooth boundary.

IIB3—41 to 58 inches; reddish brown (5YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; few patchy clay films; pale brown (10YR 6/3) silt coats on faces of peds, along cracks, and in root channels; few soft black masses; few dark stains on faces of peds; strongly acid; clear smooth boundary.

IIC—58 to 71 inches; yellowish red (5YR 4/6) loam; common medium prominent pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable; few patchy clay films; few soft black masses; neutral.

Thickness of the solum ranges from 40 to 60 inches. The effective cation-exchange capacity is 20 to 50 percent saturated with exchangeable aluminum to a depth of 30 inches or more.

The Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 or 3. It is 4 to 6 inches thick and ranges from very strongly acid to neutral.

The A2 horizon has color and reaction similar to the Ap horizon. The A2 horizon is silt loam or very fine sandy loam. Reaction ranges from very strongly acid to neutral.

The B2t horizon has hue of 5YR or 7.5YR, value of 3 to 5, and chroma of 3 to 6. It is silty clay loam, silt loam, or clay loam and ranges from extremely acid to strongly acid.

The IIB3 horizon has colors and textures similar to the B2t horizon. Reaction ranges from very strongly acid to slightly acid.

The IIC horizon has colors similar to the B horizon. Texture is loam, silty clay loam, or silty clay. Reaction ranges from very strongly acid to neutral.

Sterlington Series

The Sterlington series consists of well drained, moderately permeable soils. These soils formed in loamy alluvium deposited by the Arkansas River. They are on natural levees bordering Bayou Bonne Idee and other former channels and distributaries of the Arkansas River. Slope ranges from 0 to 3 percent.

The soils of the Sterlington series are coarse-silty, mixed, thermic Typic Hapludalfs.

Sterlington soils commonly are near Gallion, Hebert, Mer Rouge, Perry, Portland, and Rilla soils. Gallion, Hebert, Mer Rouge, and Rilla soils are in similar positions and are fine-silty. The Perry and Portland soils are in backswamps and are more clayey throughout.

Typical pedon of Sterlington silt loam, 0 to 1 percent slopes, 1 mile northwest of Jones, 845 feet northwest of fence corner, 9 feet south of fence; NE1/4NE1/4, sec. 17, T. 23 N., R. 8 E.

Ap—0 to 8 inches; brown (7.5YR 4/4) silt loam; weak medium platy and weak medium subangular blocky structure; very friable; few fine roots; medium acid; abrupt smooth boundary.

B2t—8 to 22 inches; reddish brown (5YR 5/4) silt loam; weak medium subangular blocky structure; friable; few fine roots; few very fine pores; thin patchy clay films on faces of peds; very strongly acid; clear smooth boundary.

A&B—22 to 28 inches; brown (7.5YR 5/4) very fine sandy loam (A) and dark brown (7.5YR 4/4) very fine sandy loam (B); weak medium subangular blocky structure; very friable; few medium roots; few very fine pores; very strongly acid; clear smooth boundary.

B'2t—28 to 57 inches; reddish brown (5YR 5/4) silt loam; streaks and pockets of A2 material; weak medium subangular blocky structure; friable; few fine and very fine pores; thin nearly continuous clay films; very strongly acid; clear smooth boundary.

C—57 to 75 inches; strong brown (7.5YR 5/6) very fine sandy loam; common medium distinct reddish brown (5YR 5/4) mottles; massive; very friable; strongly acid.

Thickness of the solum ranges from 40 to 60 inches. Base saturation ranges from 60 to 80 percent at a depth of 50 inches below the upper boundary of the B horizon.

The effective cation-exchange capacity is 20 to 50 percent saturated with exchangeable aluminum.

The Ap horizon has hue of 5YR, 7.5YR, or 10YR; value of 3 to 5; and chroma of 2 to 4. It is 4 to 8 inches thick and ranges from very strongly acid to medium acid, except where limed. Texture is silt loam or very fine sandy loam.

An A2 horizon is in some pedons. Where present, it ranges in thickness from 5 to 10 inches. It is silt loam or very fine sandy loam and ranges from very strongly acid to medium acid. It has the same range in colors as the Ap horizon.

The B2t and B'2t horizons have hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. They are silt loam, loam, or very fine sandy loam, and range in reaction from very strongly acid to slightly acid. Subhorizons of the B horizon commonly contain A2 material that has colors of 3 chroma or more.

The C horizon has colors and textures similar to the Bt horizon. It is very fine sandy loam, loam, silt loam, or silty clay loam. Reaction ranges from very strongly acid to mildly alkaline.

Tillou Series

The Tillou series consists of somewhat poorly drained, slowly permeable soils. These soils formed in loess over loamy sediments. They are on terrace uplands. Slope ranges from 0 to 2 percent.

The soils of the Tillou series are fine-silty, mixed, thermic Aquic Glossudalfs.

Tillou soils are similar to Frizzell soils and commonly are near Bussy, Debute, and Guyton soils. The moderately well drained Bussy soils are on steeper and more convex slopes. The well drained Debute soils are on steeper side slopes above major drainageways. The somewhat poorly drained Frizzell soils are in similar positions and are coarse-silty. The poorly drained Guyton soils are along drainageways.

Typical pedon of Tillou silt loam, 16 miles northeast of Bastrop, 120 feet north of Georgia-Pacific gravel road, 25 feet east of woods road; SW1/4NE1/4, sec. 9, T. 23 N., R. 7 E.

A1—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam; weak medium subangular blocky and weak fine granular structure; friable; common fine and medium roots; strongly acid; clear smooth boundary.

A2—5 to 8 inches; brown (10YR 5/3) silt loam; common medium distinct dark grayish brown (10YR 4/2) mottles; weak coarse subangular blocky structure; friable; common fine and very fine roots; common fine black iron-manganese concretions; very strongly acid; clear wavy boundary.

B21t—8 to 15 inches; yellowish brown (10YR 5/4) silt loam; common medium faint dark brown (10YR 4/3) and few medium faint light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; few fine roots; few fine pores; thin patchy clay films on faces of peds; common fine black iron-manganese concretions; very strongly acid; clear wavy boundary.

B&A—15 to 20 inches; yellowish brown (10YR 5/4) silt loam (60 percent B); light brownish gray (10YR 6/2) silt loam (40 percent A); common medium distinct dark yellowish brown (10YR 4/4) and common coarse distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; few medium roots; few fine pores; common fine black iron-manganese concretions; few black streaks; few brittle bodies; the A2 material is interspersed within the peds; very strongly acid; gradual wavy boundary.

A&B—20 to 30 inches; light gray (10YR 7/2) silt loam (60 percent A) and yellowish brown (10YR 5/4) silt loam (40 percent B); weak medium subangular blocky structure; friable; few fine roots; common fine pores; few fine black and brown iron-manganese concretions; about 20 percent brittle bodies that are up to 2 inches in diameter; strongly acid; abrupt irregular boundary.

B'22t—30 to 40 inches; yellowish brown (10YR 5/4) silty clay loam; 10 percent light brownish gray (10YR 6/2) silt coatings and streaks; weak medium subangular blocky structure; firm, plastic and sticky; many fine pores inside of peds; thin patchy clay films; common black and brown concretions that are up to 3 cm in diameter; about 20 percent firm brittle bodies that are up to 5 cm in diameter; ped interiors interspersed with silt; strongly acid; abrupt irregular boundary.

IIB'23t—40 to 48 inches; brownish yellow (10YR 6/6) and light yellowish brown (10YR 6/4) silty clay loam; moderate medium and coarse subangular blocky structure; firm; few fine roots; common very fine pores; thin patchy clay films on peds and in pores; few fine and medium black and brown concretions; few thin silt coats on peds; strongly acid; gradual wavy boundary.

IIB'24t—48 to 66 inches; light yellowish brown (10YR 6/4) silt loam; weak very coarse subangular blocky structure; very firm and hard; slightly brittle; few fine roots between peds; common very fine pores in peds; thick continuous clay films on vertical faces of peds; thin continuous clay films on horizontal faces of peds; common very fine black stains on faces of peds; few fine and medium brown concretions; few medium pale brown (10YR 6/3) silt pockets; slightly acid; gradual wavy boundary.

IIB'25t—66 to 76 inches; yellowish brown (10YR 5/4) silt loam; common medium faint dark yellowish brown (10YR 4/4) and light brownish gray (10YR 6/2) mottles; weak coarse and very coarse subangular blocky structure; few fine roots; many fine pores;

few discontinuous clay films; few fine black concretions; few black stains; neutral.

The thickness of the solum ranges from 40 to 100 inches or more. The reaction in the A1, B&A, A&B, and B'22t horizons ranges from medium acid to very strongly acid, except for the surface layer where limed. The reaction of IIB'23t and lower horizons ranges from strongly acid to mildly alkaline. The effective cation-exchange capacity is 50 percent or more saturated with exchangeable aluminum in the control section to a depth of 30 inches or more.

The A1 and A2 horizons have hue of 10YR, value of 3 to 5, and chroma of 2 to 4. Thickness of the A1 horizon ranges from 3 to 7 inches.

The B2t horizon has hue of 10YR, value of 4 to 6, and chroma of 4 to 6. Mottles are in shades of gray, yellow, and brown. Texture is silt loam or silty clay loam.

The B&A and A&B horizons have Bt parts with the same color and texture as the above B2t horizon. The A2 part has hue of 10YR, value of 5 to 7, and chroma of 1 to 3.

The B'2t horizon has hue of 10YR, value of 4 to 6, and chroma of 4 to 6. Mottles are in shades of gray, brown, and red. Texture is silt loam or silty clay loam.

Udalfs

Udalfs consist of excessively drained to somewhat poorly drained soils on an escarpment between terrace uplands and flood plains. The area is dissected by many drainageways and gullies. Slope ranges from 5 to 30 percent.

The soil material is variable, but it is dominantly loamy. Texture ranges from loamy fine sand to clay throughout. The soil material ranges from dark grayish brown to red in color. Reaction ranges from very strongly acid to neutral.

Wrightsville Series

The Wrightsville series consists of poorly drained, very slowly permeable soils. These soils formed in loamy and clayey alluvium that is mixed with loess. They are on low stream terraces. Slope ranges from 0 to 1 percent.

The soils of the Wrightsville series are fine, mixed, thermic Typic Glossaqualfs.

Wrightsville soils commonly are near Groom, Guyton, Libuse, Perry, and Portland soils. The Groom and Guyton soils are in similar positions and are loamy throughout. Libuse soils are in higher positions and have a fragipan. Perry and Portland soils are on flood plains and are clayey throughout.

Typical pedon of Wrightsville silt loam, about 7 miles northwest of Bastrop, 3,880 feet west of intersection of parish roads 1233 and 2205, 120 feet south of gravel road; SW1/4NW1/4, sec. 17, T. 22 N., R. 5 E.

A1—0 to 2 inches; dark grayish brown (10YR 4/2) silt loam; weak medium subangular blocky structure; friable; many fine roots and leaves; very strongly acid; clear smooth boundary.

A2g—2 to 11 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct strong brown (7.5YR 5/6) and brown (7.5YR 4/4) mottles; weak medium subangular blocky structure; friable; few fine and common medium roots; common fine pores; very strongly acid; clear irregular boundary.

Bg&Ag—11 to 19 inches; gray (10YR 6/1) silty clay loam (Bg); 30 percent tongues, 2 to 6 inches wide, of light brownish gray (10YR 6/2) silt loam (Ag) extending through the horizon; common medium distinct strong brown (7.5YR 5/6) and few fine distinct brown mottles; silty clay loam material has moderate medium subangular blocky structure and firm consistence; silt loam material has weak medium subangular blocky structure and friable consistence; few fine pores in silt loam material; very strongly acid; gradual wavy boundary.

B2tg—19 to 28 inches; light brownish gray (10YR 6/2) silty clay; many coarse faint grayish brown (10YR 5/2) and common medium distinct yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; firm; tongues of light gray (10YR 7/1) silt loam, 1 to 3 inches wide, extend to a depth of 27 inches; few fine roots; few fine pores; common discontinuous clay films on faces of peds; some clay bands as thick as 5 mm are in crayfish casts; very strongly acid; clear smooth boundary.

B3tg—28 to 43 inches; light brownish gray (10YR 6/2) silty clay; common medium faint brownish yellow (10YR 6/6) and few fine distinct yellowish red mottles; weak coarse prismatic structure parting to weak medium subangular blocky; firm; few fine roots; common patchy clay films on faces of peds; very strongly acid; clear smooth boundary.

C—43 to 73 inches; gray (10YR 6/1) silty clay; common medium distinct yellowish brown (10YR 5/6) and few medium faint grayish brown (2.5Y 5/2) mottles; massive; firm; few fine black concretions; slightly acid.

The thickness of the solum ranges from 40 to 65 inches. Base saturation is greater than 35 percent at a depth of 50 inches below the upper boundary of the Bt horizon. Reaction ranges from extremely acid to strongly acid throughout, except in the C horizon. Reaction in the C horizon ranges from strongly acid to moderately alkaline.

The A1 horizon has hue of 10YR, value of 4 to 5, and chroma of 2. It is 1 to 4 inches thick.

The A2g horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Mottles in shades of gray and brown range from few to many. The A2g horizon is silt loam or silty clay loam.

The Btg horizon has the same colors and mottles as the A2g horizon. Tongues of A2g material, 1 to 6 inches wide, extend down into the Btg horizon. Mottles in shades of gray, brown, or red range from few to common. The Btg horizon is silty clay loam, silty clay, or clay.

The C horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2, or it is neutral. Mottles in shades of gray and brown range from few to many. The C horizon is silty clay loam, silty clay, or clay.

The Wrightsville soils in Morehouse Parish are taxadjuncts to the Wrightsville series because they have reddish mottles in the argillic horizon. This difference, however, does not affect the use and behavior of these soils for present and expected land uses.

Yorktown Series

The Yorktown series consists of very poorly drained, very slowly permeable soils. These soils formed in clayey alluvium deposited by the Arkansas River. They are in former stream channels and backswamps on flood plains near Bayou Bonne Idee and Bayou Bartholomew. Slope ranges from 0 to 1 percent.

The soils of the Yorktown series are very-fine, montmorillonitic, nonacid, thermic Typic Fluvaquents.

Yorktown soils commonly are near Hebert, Perry, and Portland soils. The somewhat poorly drained Hebert soils are in higher positions and are loamy throughout. The poorly drained Perry soils and the somewhat poorly drained Portland soils are in slightly higher positions and have vertic properties.

Typical pedon of Yorktown clay, frequently flooded, 1/4 mile northwest of Jones; NW1/4NE1/4; sec. 21; T. 23 N., R. 8 E.

01—2 to 0 inches; dark brown (7.5YR 3/2) partially decomposed leaves, roots, and twigs; strongly acid; abrupt smooth boundary.

A1—0 to 7 inches; dark gray (10YR 4/1) clay; weak coarse subangular blocky structure; very sticky and firm; many fine roots; very strongly acid; clear smooth boundary.

B21g—7 to 17 inches; dark gray (10YR 4/1) clay; common medium distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; very sticky and firm; few fine roots; very strongly acid; clear smooth boundary.

B22g—17 to 30 inches; gray (10YR 5/1) clay; common medium prominent strong brown (7.5YR 5/6) and few medium faint dark gray (10YR 4/1) mottles; moderate medium subangular blocky structure; very sticky and very firm; few fine roots; very strongly acid; clear smooth boundary.

B23g—30 to 48 inches; gray (10YR 5/1) clay; common medium prominent strong brown (7.5YR 5/6) and common medium prominent yellowish red (5YR 5/6) mottles in lower part of horizon; moderate medium subangular blocky structure; very sticky and very firm; few fine roots; very strongly acid; clear wavy boundary.

B3—48 to 60 inches; reddish brown (5YR 4/4) clay; few fine prominent gray mottles; weak moderate blocky structure; firm; very strongly acid.

The thickness of the solum ranges from 50 to 80 inches. Depth to the B3 horizon ranges from 42 to 60 inches.

The A1 horizon has hue of 10YR or 5Y, value of 4 to 6, and chroma of 1. It is 4 to 10 inches thick and ranges from very strongly acid to medium acid.

The B2g horizon has hue of 10YR or 5Y, value of 4 to 6, and chroma of 1. Mottles are in shades of red and brown. The B2g horizon ranges from very strongly acid to medium acid.

The B3 horizon has hue of 5YR, value of 4 or 5, and chroma of 3 or 4. Mottles are gray. Reaction ranges from very strongly acid to slightly acid.

The Yorktown soils in Morehouse Parish are taxadjuncts to the Yorktown series because they are more acid than the defined range for the series. This difference, however, does not affect the behavior of these soils for present and expected land uses.

Formation of the Soils

Dr. Bobby J. Miller, Department of Agronomy, Agricultural Experiment Station, Louisiana State University, helped prepare this section.

In this section the processes and factors of soil formation are described as they relate to the soils in the parish.

Processes of Soil Formation

The processes of soil formation are those processes or events occurring in soils that influence the kind and degree of development of soil horizons. The rate and relative effectiveness of the different processes are determined by the factors of soil formation: climate, living organisms, relief, parent material, and time.

Important soil-forming processes include those that result in (1) *additions* of organic, mineral, and gaseous materials to the soil, (2) *losses* of these same materials from the soil, (3) *translocations* of materials from one point to another within the soil, and (4) physical and chemical *transformations* of mineral and organic materials within the soil (*35*). Typically, many processes take place simultaneously in soils. Examples include accumulation of organic matter, development of soil structure, formation and translocation of clay, and leaching of bases from some soil horizons. The contribution of a particular process may change over a period of time. For example, installation of drainage and water-control systems can change the length of time soils are flooded or saturated with water.

Organic matter has accumulated and undergone partial decomposition and incorporation in all the soils in Morehouse Parish. Organic matter accumulation is greatest in and above the surface horizon of the soil. This results in the formation of soils in which the surface horizon is higher in organic matter content than the deeper horizons. The decomposition, incorporation, and mixing of organic residues into the soil horizons is brought about largely by the activity of living organisms. Many of the more stable products of decomposition remain as finely divided materials that contribute dark color, increase available water and cation-exchange capacities, contribute to granulation, and serve as a source of plant nutrients in the soil.

The addition of alluvial sediment at the surface has been important in the formation of some soils in the parish. The added sediment provides new parent material in which the processes of soil formation can occur. In many cases, accumulation of new material has been faster than the processes of soil formation could appreciably alter the material. This is evident as depositional strata in the lower horizons of many of the soils that developed in alluvial sediments.

Processes resulting in development of soil structure have taken place in all the soils. Plant roots and other organisms are effective agents in the rearrangement of soil material into secondary aggregates. Decomposition products of organic residues, secretions of organisms, clays, and oxides of elements such as iron that form during soil development serve as cementing agents that help stabilize structural aggregates. Alternate wetting and drying as well as shrinking and swelling contribute to the development of structural aggregates and are particularly effective in soils that have appreciable amounts of clay, such as the Perry and Portland soils.

The poorly drained and very poorly drained soils in the parish have horizons in which reduction and segregation of iron and manganese compounds have been important processes. Reducing conditions have prevailed for long periods of time in these poorly aerated horizons. Consequently, the somewhat soluble reduced forms of iron and manganese are predominant over the less soluble oxidized forms. Reduced compounds of these elements can result in the gray colors that are characteristic of the Bg and Cg horizons in such soils as Guyton and Perry soils. In the more soluble reduced forms, appreciable amounts of iron and manganese may be removed from the soils or translocated from one position to another within the soil by water. The presence of browner mottles in predominantly gray horizons indicate segregations and local concentrations of oxidized iron compounds as a result of alternating oxidizing and reducing conditions.

Loss of components has occurred to some extent during the formation of all the soils. Water moving through the soil has leached soluble bases and any free carbonates that may have been initially present. The effects of leaching are least pronounced in soils developed in relatively young parent materials that were initially high in bases. These include the Gallion, Mer Rouge, Perry, Portland, and Yorktown soils.

The formation, translocation, and accumulation of clay in the profile have been important processes during the development of all soils in the parish except the Allemands, Cascilla, Litro, Perry, Portland, and Yorktown soils. Silicon and aluminum released as a result of weathering of such minerals of pyroxenes, amphiboles, and feldspars can recombine with the components of water to form secondary clay minerals such as kaolinite. Layer silicate minerals such as biotite and montmorillonite can also weather to form other clay minerals such as vermiculite or kaolinite. Horizons of secondary accumulation of clay result largely from translocation of clays from upper to lower horizons. As water moves downward it can carry small amounts of clay in suspension. This clay accumulates at the depths of the penetration of the water or in horizons where it becomes flocculated or filtered out by fine pores in the soil. Over long periods, such processes can result in distinct horizons of clay accumulation.

Secondary accumulations of calcium carbonate may be present in the lower solum in some of the soils. Carbonates dissolved from overlying horizons may have been translocated to this depth by water and redeposited. Other sources and processes may contribute in varying degrees to carbonate accumulation; for example, segregation of material within the horizons, upward translocation of material in solution from deeper horizons during fluctuations of water table levels, and contributions of materials from such readily weatherable minerals as plagioclase. Typically, calcium carbonate is not naturally present in the surface horizon of any of the soils mapped in the parish. It may be present, however, in horizons that are more than about 2 feet deep in some areas of the Gallion, Lafe, Mer Rouge, Perry, Portland, and Yorktown soils.

Factors of Soil Formation

A soil is a natural, three-dimensional body that formed on the earth's surface and that has properties resulting from the integrated effect of climate and living organisms acting on parent material, as conditioned by relief over periods of time.

The interaction of five main factors influences the processes of soil formation and results in differences between the soils. These factors are the physical and chemical composition of the parent material; the climate during the formation of soil from the parent material; the kind of plants and other organisms living in and on the soil; the relief of the land and its effect on runoff and soil moisture conditions; and the length of time the soil has been forming (*8, 14*).

The effect of any one factor can differ from place to place, but the interaction of all the factors determines the kind of soil that forms. Because of these interactions, it is recognized that many of the differences between the soils cannot be attributed to differences in only one factor. For example, the organic matter content in a soil is influenced by several factors, including relief, parent material, and living organisms. In the following paragraphs the factors of soil formation are described as they relate to the soils in Morehouse Parish.

Climate

Morehouse Parish is in a region characterized by a humid, subtropical climate. The climate is generally uniform throughout the parish; therefore, the local differences between soils that developed in parent materials that are similar in age are not the result of differences in climate. The wide differences in the degree of weathering, leaching, and translocation of clay are chiefly the result of variations in time, relief, and parent material rather than climate.

The warm average temperatures and large amounts of precipitation favor a rapid rate of weathering of readily weatherable materials. Weathering and leaching, which have occurred to some extent in most soils, are typically indicated by either, or both, a soil reaction that is less acid and a base saturation that is higher in the lower horizons than in the upper horizons of all but the most highly leached soils, such as the Debute and Mollicy soils. Weathering processes that have resulted in the release and reduction of iron are evident in the gray Ag, Bg, or Cg horizons of soils such as the Guyton, Perry, and Portland soils. Oxidation and segregation of iron, the result of alternating oxidizing and reducing conditions, is indicated by mottled horizons in many of the soils. Only the well drained soils such as the Dexter, Gallion, Rilla, and Sterlington soils do not have gray mottles within the solum.

The effect of climate is also shown in the clayey soils that have large amounts of expanding-lattice minerals where large changes in volume occur upon wetting and drying. Wetting and drying cycles and the associated volume changes contribute to the formation and stabilization of structural aggregates in the soils. When wet soils dry out, cracks of variable width and depth may form as a result of the decrease in volume. Climate influences the formation of these cracks and the depth and extent of the cracking. Repeated large changes in volume frequently result in structural problems for buildings, roads, and other improvements on the soils. Formation of deep, wide cracks may shear the roots of plants growing in the soil. If cracks are present much of the water from rainfall or irrigation initially enters the soil through the cracks. Once the soil has become wet, however, infiltration rates are slow or very slow. Cracks occur extensively in the Litro, Perry, and Portland soils late in summer and early in fall when the soils are driest. At this time, cracks of an inch or more in width extending to a depth of more than 20 inches may form in most years. Cracks that are less extensive and not as deep sometimes form in the more silty soils, such as the Forestdale and Wrightsville soils.

Living Organisms

Living organisms affect soil formation in a number of ways and exert a major influence on the kind and extent of horizons that develop. Soil porosity, structure, and the incorporation of organic matter are influenced by the growth of plants and the activity of other organisms that physically disturb the soil. Photosynthesis of plants utilizes energy from the sun to synthesize the compounds necessary for growth and the production of additional organic matter. Growth and the eventual decomposition of plants recycles nutrients from the soil and serves as a major source of organic residue. Decomposition and incorporation of organic matter by micro-organisms enhances the development of soil structure and generally increases the infiltration rate and available water storage capacity in soils. Relatively stable organic compounds in soils generally have very high cation-exchange capacities. These compounds increase the capacity of the soil to absorb and store such nutrients as calcium, magnesium, and potassium. The effect of these and the kind of organic matter produced can vary widely, depending on the kinds of organisms living in and on the soil. Consequently, large differences in soils can result in areas that have widely contrasting numbers of plants and other organisms.

The Allemands soil in Morehouse Parish developed under predominantly marsh vegetation consisting mostly of marsh grasses and cattails. Some baldcypress trees also grow where this soil formed. The Mer Rouge soil developed under tall grass prairie vegetation. The remaining soils developed under forest vegetation. The native vegetation of the soils that developed in recent stream alluvium and of the Idee, Goodwill, and Dexter soils consists mainly of southern hardwood forests and associated understory and ground cover. Eastern cottonwood, American sycamore, and pecan are predominant on the higher and better drained soils, such as the Gallion, Rilla, and Sterlington soils. Cherrybark oak, sweetgum, and green ash are predominant on the clayey, poorly drained soils, such as the Perry and Portland soils. The major native trees on the clayey, very poorly drained Yorktown soils are baldcypress, water tupelo, and water hickory. The remaining soils developed under southern pine.

Differences in the amount of organic matter that has accumulated in and on the soils are greatly influenced by the kinds and quantities of micro-organisms present. Aerobic organisms utilize oxygen from the air and are chiefly responsible for organic matter decomposition through rapid oxidation of organic residues. These organisms are most abundant and prevail for longer periods in such better drained and better aerated soils as Gallion, Sterlington, and Dexter soils. In the most poorly drained soils, anaerobic organisms are predominant throughout most or all of the year. Anaerobic organisms do not require oxygen from the air, and they decompose organic residues very slowly. Differences in decomposition by micro-organisms can result in large accumulations of organic matter in such poorly drained soils as Perry soils, while in such better drained soils as Rilla soils the accumulation is much less. The Allemands soil is an organic soil (Histosol) and has developed in wet, poorly drained areas where production of organic residues has exceeded rates of decomposition and incorporation into the mineral soil horizons for a long period of time.

Relief

Relief and other physiographic features influence soil formation processes by affecting internal soil drainage, runoff, erosion and deposition, and exposure to the sun and wind.

Parent Material and Time

Most of the soils in Morehouse Parish developed in unconsolidated materials deposited by water and wind. The nature of these parent materials helps determine certain differences in soil color, texture, permeability, and depth and degree of leaching. These materials have also had a major influence on the mineralogy of the soils and are significant factors in determining the susceptibility of the soils to erosion.

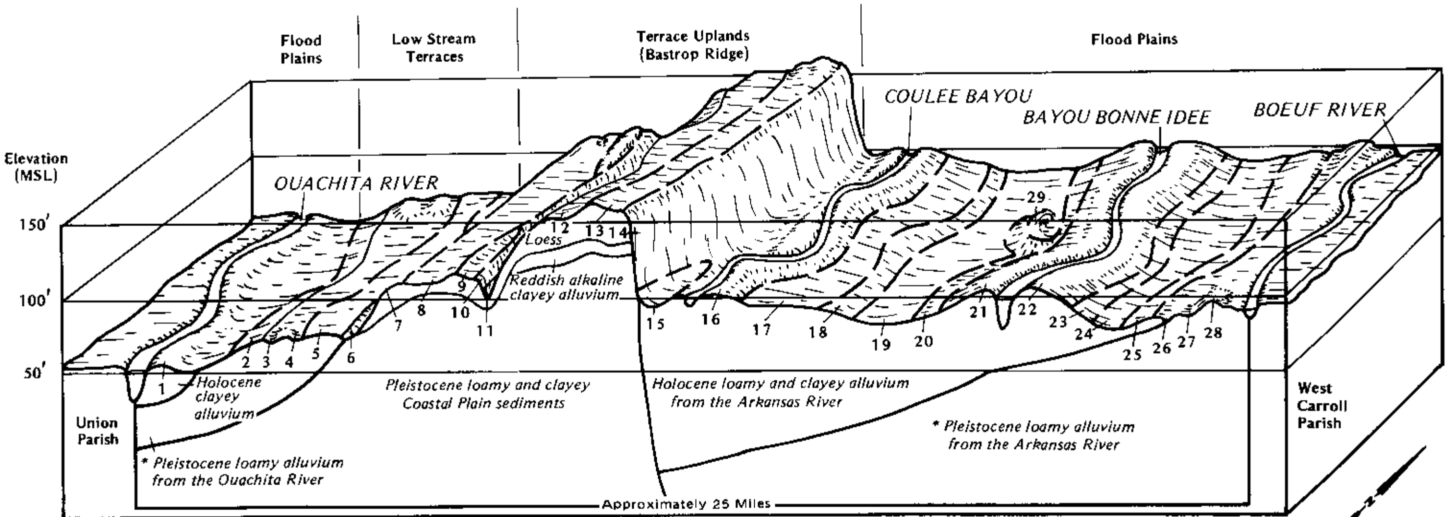
Parent material and time are independent factors of soil formation. A particular kind of parent material may have been exposed to processes of soil formation for periods ranging from a few years to more than a million years. The length of time influences the kinds of soil horizons and their degree of development. Long periods of time are generally required for prominent horizons to form. In Morehouse Parish, possible differences in the time of soil formation amount to several thousand years for some of the soils.

The 27 soils mapped in Morehouse Parish developed in a variety of different parent materials that range in age from the most recent local alluvium along streams in the uplands to the late to middle Pleistocene sediments that form the core of the uplands. The nature, source, and time of deposition of the different parent materials have not been definitely established in all areas. The typical parent material and landscape position of each soil mapped in the parish are shown in figure 9. These relationships, the time of deposition of the parent materials, and the time of soil formation are discussed in detail in the section "Landforms and Surface Geology."

Landforms and Surface Geology

Dr. Bobby Miller, Department of Agronomy, Agricultural Experiment Station, Louisiana State University, helped prepare this section.

The surface features of the land and the nature and distribution of the different parent materials in which the soils in Morehouse Parish formed are the result of



Numerals 1-29 which are shown by leader to the land surface, indicate the kinds of soil as follows:

1. Litro and Perry
2. Haggerty
3. Groom
4. Mollicy
5. Wrightsville and Groom
6. Lafe
7. Debute and Libuse
8. Frizzell and Guyton
9. Libuse
10. Debute
11. Guyton and Cascilla
12. Tillou and Guyton
13. Bussy
14. Udalfs
15. Allemands
16. Sterlington and Gallion
17. Mer Rouge and Gallion
18. Hebert and Portland
19. Perry
20. Hebert and Portland
21. Rilla
22. Sterlington
23. Hebert and Portland
24. Perry
25. Forestdale
26. Idee
27. Goodwill
28. Dexter
29. Yorktown

* Upper layers mixed with loess in most places.

Figure 9.—Relationship of the soils, landscape, and parent materials across Morehouse Parish.

events during and since the latter part of the Pleistocene Epoch, which began about 2 million years ago. At the surface, however, the entire area comprises unconsolidated alluvial or eolian deposits that are less than about 100,000 years old (*33*).

Physiographically, the parish consists of three general areas. The Holocene Age *flood plains* of the Ouachita River, Bayou Bonne Idee, and other former channels of the Arkansas River make up about 73.5 percent of the parish. A late Pleistocene Age *stream terrace* of the Ouachita River makes up about 5.5 percent, and the Pleistocene Age *terrace uplands* make up the remaining 21 percent. Each of these three general areas can be further subdivided on the basis of differences in either soil parent material, time of deposition, or physiographic features. The relationships between the different geologic materials, the soils, and the landscape are shown in figure 9. The major surface features, geologic nature, and relative ages of the regions are described in the sections that follow.

Flood Plains

The flood plains can be subdivided into two major subregions on the basis of major differences in age and source of the sediments. Holocene Age alluvial deposits of the Arkansas River make up the youngest and most extensive subregion. Sediments associated with older braided-stream terrace deposits of the Arkansas River make up the smaller subregion.

Holocene Age Arkansas River Alluvium

Holocene Age deposits of the Arkansas River together possibly with some clayey Mississippi River alluvial deposits in backswamp areas cover about 66.5 percent of the parish. More soils developed in these sediments than in any other parent material in the parish. These areas are represented by the Hebert-Sterlington-Rilla; Gallion-Mer Rouge-Hebert; Litro-Haggerty; Litro-Haggerty, Flooded; Perry-Portland; and Perry-Portland, Flooded, general soil map units. All of the soils in these units, except the Haggerty soils, formed in Holocene Age deposits. The Haggerty soils are locally on higher positions within the flood plains in the northwestern part of the parish and formed in older sediments.

The Arkansas River alluvium in this area was deposited during the period from about 5,000 to 1,000 years ago, according to Saucier (*33, 34*). At various times during that period all or part of the river's flow was carried by channels that included the approximate present channels of Bayou Bartholomew, Bayou Bonne Idee, the Ouachita River, the Boeuf River, and a few other smaller distributaries.

Partial sorting of sediments occurs when a stream overflows; its initial decrease in water velocity and transporting capacity results in rapid deposition of sediments. As the velocity of the water decreases, the initial deposits are high in sand content, followed by siltier and then more clayey materials. The clayey backswamp sediments are deposited by still or slowly moving water in low areas behind natural levees. Characteristically, this depositional pattern results in long, nearly level slopes that extend from natural levees near streams to clayey backswamp deposits.

The highest elevation in this subarea is about 110 feet on the natural levees along Bayou Bonne Idee in the northern part of the parish. The lowest is about 60 feet in the clayey backswamp deposits near the southern edge of the parish.

The normal distribution of soils from the highest position on the natural levee to the lowest backswamp area is Sterlington, Rilla, Hebert, Portland, and Perry soils, in that order. Although Gallion and Mer Rouge soils formed in positions analagous to those of the Rilla soils, they differ because of factors other than landscape position. Mer Rouge soils formed under grassland vegetation and are higher in content of bases and organic matter and are darker than Rilla soils. Gallion soils were leached less than the Rilla soils and thus are less acid and are higher in content of bases than Rilla soils. Litro soils formed in positions analagous to those of the Perry soils, but they are only on the flood plains of the Ouachita River and are not associated with the Sterlington, Rilla, and Hebert soils.

The soils that developed in loamy sediments (Sterlington, Rilla, Hebert, Gallion, and Mer Rouge soils) have well-developed sola characterized by a distinct horizon of secondary accumulation of illuvial clays. This degree of development is a reflection of the relatively old age of these sediments and the stability of the landscapes they occupy. Soils that developed on natural levees along active meander belts of large rivers that overflow their banks typically have indistinct profiles and show no evidence of clay illuviation (*38*).

Litro, Perry, and Portland soils developed in the extensive clayey backswamp areas. These soils do not have horizons that show secondary accumulations of clay. Such horizons develop very slowly, if at all, in clayey material. The high clay content, the expanding-lattice characteristic of much of the clay, a high water table for much of the year, and frequent flooding during soil development all probably retarded the development of these horizons in the Litro, Perry, and Portland soils. All of these soils typically have very dark grayish upper horizons and are redder in the lower part of the solum. They are somewhat leached and have acid reactions in the upper horizons and become neutral or more alkaline with depth. Portland soils occupy the slightly higher and better drained positions and have the redder horizons at shallower depths than the Perry soils.

Either, or both, of two possible explanations could account for this color distribution in the horizon. The development of A horizons in thin, clayey, Mississippi River backwater deposits overlying the redder clayey deposits of the Arkansas River could result in the conditions described. The natural gray color of Mississippi River alluvial clays and the landscape relationships are consistent with this explanation. These same soil colors, however, could also be the result of A horizon development and differences in the times, duration, and intensity of reducing conditions in these soils, especially after the development of a slightly acid condition in the upper horizons. In laboratory tests, slightly acid, red, clayey sediments from the area become gray in less than 30 days if they are submerged in water to which an energy source (sucrose) for organisms has been added and then sealed with a gas trap to prevent introduction of oxygen to the system.

The Yorktown soil formed in clayey sediments accumulated in old oxbow lakes and other areas that are almost continuously wet or impounded. This soil never dries throughout the solum and is saturated below a depth of less than a foot for most of the year. Soil horizonation is indistinct, except for the development of an A1 horizon at the surface, and these soils are only slightly leached. Stratification resulting from deposition is normally evident at a depth of 3 feet or less.

The Allemands soil is an organic soil (Histosol) that formed in very poorly drained or ponded locations on the western edge of the alluvial plain where it adjoins the higher terrace uplands to the west. These areas are almost continuously wet. A high water table, lack of drainage channels, and seepage water from the higher terrace uplands and higher positions in adjoining parts of the alluvial plain all probably contribute to this condition.

Braided-Stream Terrace Deposits

A complex of sediments associated with braided-stream deposits of the Arkansas River cover about 2.5 percent of the parish and occur in the eastern part of the parish in areas approximately paralleling the Boeuf River. These are the oldest sediments in that part of the parish at elevations lower than the terrace uplands. Dexter, Forestdale, Goodwill, and Idee soils have formed at least partially in these materials. These sediments occur in the Forestdale-Idee-Goodwill general soil map unit. Exposed areas of these sediments are as much as 10 feet higher than the adjoining more recent alluvium that overlies them along their margins in almost all other areas. Thus, areas of these sediments grade almost imperceptibly to areas of the more recent alluvium. Investigations conducted in the parish during the course of the survey together with studies in West Carroll (*22*), Franklin (*25, 26*), and other parishes (*31*) document the relationships among these sediments.

These areas are everywhere underlain by stratified, sandy, braided-stream deposits of the Arkansas River. These materials are mostly sand and gravel deposited by swiftly flowing, sediment-choked rivers at a time when they may have drained areas of active glaciation to the west and north. The time of deposition of these materials was estimated by Saucier to be approximately 1,000 to 20,000 years ago (*33, 34*). This in turn was followed by deposition of a thin mantle of Peorian Loess that thickens continuously eastward to a maximum of about 14 feet at the western edge of the Mississippi River flood plain in adjoining West Carroll Parish (*22*). Dexter soils developed in areas where the Peorian Loess mantle is less than about 3 to 4 feet thick and directly overlies the braided-stream deposits. Forestdale, Idee, and Goodwill soils developed in lower areas where the loess mantle is thin and where slightly more clayey alluvium was deposited on the sandier braided-stream deposits.

These relationships can be confirmed by east-west traverses across the entire Macon Ridge in almost any location. For example, in the widest parts of the ridge, where loess deposits were very thin or not present in the westernmost parts, a sandy loam or loamy sand soil developed in the high positions on the exposed braided-stream terrace. Areas of such a soil are common in Franklin Parish near the town of Liddieville (*25, 26*). As already described, the Dexter soil formed in comparable areas where the loess mantle is about 18 to 50 inches thick. In areas where the loess is thicker, soils that developed entirely in the loess can be identified. In these areas the loess is underlain by buried soils developed in the sandier materials in the highest landscape positions and by the more clayey sediments which in turn are underlain by the sandier deposits in the lowest landscape positions. At the base, the loess characteristically contains an admixture of the underlying sediment in a zone that typically is 1 to 4 feet thick (*31*). These areas apparently represent the westernmost surface exposure of the Macon Ridge, which lies mostly to the east and extends north-south through West Carroll, Madison, and Franklin Parishes and into Catahoula Parish in Louisiana. In Morehouse Parish these exposed areas are high positions that were not buried by Holocene Age deposits of the Arkansas River (fig. 9). In areas where the more recent deposits are thin and were mapped adjoining the older sediments, the two can be observed superposed, as shown in figure 9.

Low Stream Terrace

A late Pleistocene Age alluvial terrace of the Ouachita River makes up about 5.5 percent of the parish and occurs mostly in a north-south band parallel to the present course of the river. The material in this area is younger, is less dissected, and occurs at lower elevations than the adjoining terrace uplands to the east. Elevation ranges from about 65 feet in the northwestern part to about 85 feet in the eastern part. This terrace has been identified as of Deweyville Age, and the time of deposition placed at 20,000 to possibly 30,000 years ago (*33, 34*). Figure 9 shows the typical relationship of this terrace to older underlying sediments and the younger clayey deposits that overlie it along the western edge. A thin veneer of Peorian Loess also covers this terrace in most places. Groom, Haggerty, Lafe, Mollicy, and Wrightsville soils formed in these deposits. These deposits occur in the Groom-Wrightsville and Groom, Flooded, general soil map units. Although the Haggerty soils occur in areas identified as the Litro-Haggerty general soil map unit and appear to be on the flood plains, they are actually on parts of the stream terrace that protrude into the flood plain.

Investigations conducted during the survey indicated that all these soils are underlain by stratified sandy deposits within 25 feet of the surface. The investigations showed varying depths to these underlying sands, indicating an irregular topography with respect to the top of the stratified sands. In most places, less sandy sediments filled low areas in the sand, and it is these that serve as parent materials for most of the soils on the terrace.

In general, the clay content of the alluvium, or mixed loess and alluvium, and the depth to the stratified sandy sediments increase in the order Haggerty, Mollicy, Groom, and Wrightsville soils. These soils are all highly weathered and are acid throughout. They are characterized by distinct horizons with secondary accumulations of illuvial clay. The Haggerty soils typically have a loamy fine sand surface horizon and developed in areas where the less sandy sediments were not deposited or were very thin over the stratified sandy sediments.

Lafe soils have developed in silty deposits of mixed loess and alluvium on the terrace in areas near the higher, adjoining, loess-mantled terrace to the east. These soils have high levels of Na and neutral or alkaline reactions in horizons below the surface and, in some places, secondary calcium carbonate concretions are present within the solum. Weatherable minerals and other sources in the terrace uplands, which release Ca and Na that is transported by water to these lower landscape positions, are considered the major sources of the bases in these soils. Deer and other animals lick salt from areas, especially roadcuts, in the Lafe soils in a number of areas near the boundary between the Deweyville and next older terrace. Groom and Wrightsville soils formed in loamy and clayey alluvium that is mixed with loess. These soils also have high levels of Na at depths between 3 and 5 feet.

Terrace Uplands

The terrace uplands consist mainly of loess-covered Pleistocene Age terrace deposits that lie between the alluvial plain to the east and the late Pleistocene Age terrace along the Ouachita River to the west. Approximately 21 percent of the parish lies within this general area. Along the eastern edge the area is bounded by an abrupt escarpment that rises 25 to 75 feet above the adjoining alluvial plain, and on the western edge a less pronounced escarpment separates it from the late Pleistocene terrace of the Ouachita River.

Two distinct subareas of the terrace upland can be recognized on the basis of topography and elevation, and they divide the area into eastern and western segments as shown in figure 9. The eastern segment is the oldest and occupies higher elevations. It is more dissected by drainageways and has more local relief than the western segment. Elevation in this eastern area ranges from about 125 to 170 feet. In the western segment, the elevation ranges from about 85 to 125 feet. This area is characterized by a more gently sloping topography and less local relief than the eastern segment.

Beneath the loess mantle, in both the eastern and western segment, are unconsolidated strata that range from sand to clay. In the eastern segment the loess is everywhere immediately underlain by alkaline, reddish clayey deposits. Nowhere in the western segment do these materials occur immediately under the loess.

The unconsolidated Pleistocene Age alluvial deposits, loess, and local alluvium derived from these deposits thus make up the soil parent materials in the terrace uplands.

Local Alluvium

Alluvial sediments from the surrounding areas form a band paralleling stream channels that drain the terrace uplands. Major areas of these deposits form the Guyton-Cascilla, Flooded, general soil map units. Two distinctly different ages of sediment can be recognized that, depending on age, serve as parent materials for the two soils mapped in these areas.

Guyton soils developed in the oldest sediments, which are thought to be late Pleistocene, possibly Deweyville, to middle Holocene in age. These soils are highly weathered and acid throughout the upper solum. They have silty clay loam B horizons characterized by a distinct secondary accumulation of illuvial clays and typically have less clayey horizons higher and lower in the solum. In many locations these Guyton soils grade to stratified sandy materials at depths below the solum. Neutral or alkaline soil reactions and high levels of Na are present in horizons below the solum in some areas. This condition is thought to result mostly from accumulations of bases released by the breakdown of weatherable minerals in soils higher in the landscape and their subsequent translocation by water to these lower positions.

The youngest sediments in these areas, which are parent materials of the Cascilla soils, for the most part have been deposited during the past 4,000 to 5,000 years. The Cascilla soils have silt loam textures throughout and have no horizons of secondary accumulation of illuvial clays. They typically occupy positions that are closer to the stream channel and are slightly higher than the Guyton soils. In places, however, buried soils with surfaces identical to the Guyton soils can be recognized beneath the Cascilla soils.

Loess

Investigations conducted during the course of the survey indicated that both the eastern and western segments of the terrace uplands are mantled by uniform silty deposits that have a low sand content. Rehage (*31*) studied the thickness, distribution, and other characteristics of these materials in detail. He found that the deposits have a maximum thickness of approximately 14 feet near the eastern edge and are thinnest at less than 2 feet along the western edge. Except where interrupted by erosion, the sediments form a continuous mantle over the pre-existing topography regardless of elevation. Based largely on thickness and distribution patterns together with particle size he concluded that they are eolian deposits. Rehage demonstrated that the major source of the deposits were ancient alluvial plains east of the terrace uplands. He also indicated that ancient Ouachita River alluvial deposits, probably the Deweyville Terrace now present in the area, was a local source for some of the eolian deposits in the western part of the area.

The age of the loess deposit has not been definitely established (*10, 11, 17, 21, 32, 36, 37, 46*). There is little doubt that it is older than the Peoria Loess that mantles the Macon Ridge in adjoining West Carroll Parish (*22*) to the east. Characteristics of the loess and soils developed in the loess are similar to those described by Touchet and Daniels (*39*) in a Pre-Prairie, post-Montgomery loess in Evangeline Parish.

The Tillou, Bussy, Debute, Frizzell, and Libuse soils formed in the loess deposits. Tillou and Bussy soils formed in the thickest loess and occur mostly on the eastern segment of the terrace uplands. Debute, Frizzell, and Libuse are more prevalent on the western segment where the loess mantle is relatively thin.

Rehage (*31*) compared physical, chemical, and mineralogical characteristics of soils developed in Peoria Loess with those developed in the older loess. Those in the older loess have thicker sola, redder colors in the lower part of the sola, greater clay maxima and greater depths to clay maxima in the argillic horizon, larger clay content in the sola, and greater thickness of sola. Chemically, they have a more acid reaction, a lower base status, and larger quantities of exchangeable A1 and extractable acidity. Soils developed in the older loess also contain fewer weatherable minerals in the silt-size fraction and have larger amounts of kaolinite and soil-vermiculite and lesser amounts of smectite and micaceous clays than soils developed in Peoria Loess.

Pleistocene Terrace Deposits

The oldest soil parent materials in Morehouse Parish are in the terrace uplands. Their surface exposure is almost entirely restricted to the east-facing escarpment separating the terrace uplands from the lower-lying alluvial plain. Small areas are also exposed on steep side slopes in the most dissected areas of the terrace uplands. Saucier (*33*) has identified this area as a Prairie Age terrace deposit formed about 80,000 to 100,000 years ago. Most of the soils in the terrace uplands, however, developed in younger eolian deposits.

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Glossary

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well-aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

Bottom land. The normal flood plain of a stream, subject to flooding.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning. The effective cation-exchange capacity is the sum of the exchangeable cations of calcium, magnesium, potassium, sodium, aluminum, and hydrogen.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Coefficient of linear extensibility (COLE). A quantitative method of determining the shrinking and swelling behavior of a soil. It is an estimate of the vertical component of swelling of a natural soil clod. COLE is expressed as low (00.03), moderate (0.03-0.06), and high (00.06).

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.
Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.
Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.
Soft.—When dry, breaks into powder or individual grains under very slight pressure.
Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:
Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.
Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.
Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.
Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.
Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.
Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.
Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.
Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.
Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Arabic numeral 2 precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake in inches per hour is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The s—il is not strong enough to support loads.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

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).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

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

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

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

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.

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

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

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

Slow intake (in tables). The slow movement of w ter into the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Sola. The plural form of solum.

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

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

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

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Subsurface layer. Technically, the A2 or E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

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

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

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

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

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Tables

TABLE 1.--MAJOR CROPS

[Acreage figures for 1977 and 1980 were obtained from the Agricultural Stabilization and Conservation Service, USDA. Absence of an entry indicates that the figure was not available]

Crop	1980 Acreage	1977 Acreage	1974 Acreage	1974 Yield	1974 Yield/acre
Cotton	95,151	85,885	78,517	80,983 Bales	1.03 Bales
Rice	50,129	29,030	---	---	---
Soybeans	72,303	90,000	48,320	912,709 Bu.	18.7 Bu.
Grain sorghum	7,728	13,050	2,815	113,681 Bu.	40.4 Bu.
Wheat	1,740	4,100	745	16,470 Bu.	22.1 Bu.
Peanuts	197	616	1,366	2,642,738 Lbs.	1,934.7 Lbs.
Corn	182	---	293	9,612 Bu.	32.8 Bu.

TABLE 2.--TEMPERATURE AND PRECIPITATION

[Based on data recorded in the period 1951-73 at Bastrop, Louisiana]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F		In	In	In		In
January----	57.1	36.1	46.6	80	14	80	4.42	2.19	6.24	7	.1
February---	60.8	38.8	49.8	81	19	121	4.66	2.45	6.47	7	.5
March------	68.4	45.4	56.9	86	24	267	5.06	2.45	7.19	8	.0
April------	77.9	55.2	66.6	90	35	498	5.13	2.42	7.34	7	.0
May--------	85.3	62.1	73.8	95	46	738	4.71	2.20	6.76	6	.0
June-------	91.8	69.3	80.6	101	54	918	3.58	1.09	5.58	5	.0
July-------	94.5	72.1	83.3	102	60	1,032	4.18	2.30	5.70	7	.0
August-----	93.9	70.9	82.4	102	58	1,004	3.01	1.23	4.45	5	.0
September--	88.7	65.4	77.1	100	48	813	3.29	1.22	4.94	6	.0
October----	80.0	53.8	66.7	95	33	518	2.47	.43	4.04	4	.0
November---	68.1	44.7	56.4	86	23	213	4.61	2.41	6.40	5	.0
December---	59.7	38.4	49.1	80	16	114	5.25	2.48	7.50	8	.0
Yearly:											
Average--	77.2	54.4	65.8	---	---	---	---	---	---	---	---
Extreme--	---	---	---	105	12	---	---	---	---	---	---
Total----	---	---	---	---	---	6,316	50.37	40.83	59.44	75	.6

*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50° F).

TABLE 3.--FREEZE DATES IN SPRING AND FALL

[Based on data recorded in the period 1951-73 at Bastrop, Louisiana]

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	March 8	March 19	March 29
2 years in 10 later than--	February 25	March 11	March 23
5 years in 10 later than--	February 4	February 23	March 10
First freezing temperature in fall:			
1 year in 10 earlier than--	November 17	November 3	October 23
2 years in 10 earlier than--	November 24	November 9	October 29
5 years in 10 earlier than--	December 8	November 21	November 8

TABLE 4.--GROWING SEASON

[Based on data recorded in the period 1951-73 at Bastrop, Louisiana]

Probability	Length of growing season if daily minimum temperature is--		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	269	238	213
8 years in 10	280	249	223
5 years in 10	302	270	242
2 years in 10	329	292	261
1 year in 10	365	303	271

TABLE 5.--SUITABILITY AND LIMITATIONS OF GENERAL SOIL MAP UNITS

Map unit	Percent of area	Cultivated crops	Pasture	Woodland	Urban uses
1. Hebert-Sterlington-Rilla	27.0	Well suited	Well suited	Well suited	Moderately well suited: wetness, shrink-swell, low strength for roads, moderate and moderately slow permeability. Poorly suited to sanitary facilities.
2. Gallion-Mer Rouge-Hebert	5.0	Well suited	Well suited	Well suited	Moderately well suited: wetness, shrink-swell, low strength for roads, moderate and moderately slow permeability. Poorly suited to sanitary facilities.
3. Perry-Portland	32.0	Moderately well suited: wetness poor tilth.	Well suited	Moderately well suited: wetness, moderate seedling mortality, equipment limitations.	Severely limited: wetness, flooding, shrink-swell, low strength for roads, very slow permeability.
4. Perry-Portland, Flooded	2.5	Poorly suited: wetness, flooding, poor tilth.	Moderately well suited: wetness, flooding.	Well suited	Severely limited: wetness, flooding, shrink-swell, low strength for roads, very slow permeability.
5. Forestdale-Idee-Goodwill	2.5	Moderately well suited: wetness medium fertility, poor tilth.	Well suited	Well suited	Poorly suited: wetness, shrink-swell, low strength for roads, moderately slow and very slow permeability.
6. Litro-Haggerty	1.5	Poorly suited: wetness in spring, droughtiness, in fall, low fertility.	Moderately well suited: droughtiness, low fertility.	Moderately well suited: severe seedling equipment limitations.	Poorly suited: wetness, flooding, shrink-swell, very slow permeability.

TABLE 5.--SUITABILITY AND LIMITATIONS OF GENERAL SOIL MAP UNITS--Continued

Map unit	Percent of area	Cultivated crops	Pasture	Woodland	Urban uses
7. Litro-Haggerty, Flooded	1.5	Poorly suited: wetness, flooding, low fertility.	Poorly suited: wetness, flooding, low fertility.	Moderately well suited: equipment limitations, severe seedling mortality.	Severely limited: wetness, flooding.
8. Guyton-Cascilla, Flooded	1.5	Poorly suited: flooding, wetness.	Poorly suited: flooding, wetness, low fertility.	Moderately well suited: flooding, wetness, equipment limitations.	Severely limited: flooding, wetness.
9. Frizzell-Libuse-Debute	11.0	Moderately well suited: wetness, slope, low fertility, high and moderately high levels of aluminum.	Well suited----	Well suited---	Moderately well suited: wetness, shrink-swell, low strength for roads, slow permeability.
10. Bussy-Tillou-Guyton	10.0	Moderately well suited: slope, low fertility, wetness, high levels of aluminum.	Well suited----	Well suited---	Moderately well suited: wetness, slope, shrink-swell, low strength for roads, slow permeability. Poorly suited to sanitary facilities.
11. Groom-Wrightsville	3.0	Poorly suited: wetness, low fertility, high levels of aluminum.	Moderately well suited: wetness, low fertility.	Moderately well suited: wetness, equipment limitations.	Severely limited: wetness, flooding, shrink-swell, low strength for roads, moderately slow and very slow permeability.
12. Groom, Flooded	2.5	Poorly suited: flooding, wetness, low fertility, high levels of aluminum.	Moderately well suited: wetness, flooding, low fertility.	Moderately well suited: wetness, equipment limitations.	Severely limited: wetness, flooding, low strength for roads, moderately slow permeability.

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

Map symbol	Soil name	Acres	Percent
Ad	Allemands muck, drained	386	0.1
Bs	Bussy silt loam, 1 to 5 percent slopes	25,124	4.9
Db	Debute silt loam, 1 to 3 percent slopes	1,794	0.3
De	Debute silt loam, 3 to 8 percent slopes	6,873	1.3
Dx	Dexter silt loam, 3 to 5 percent slopes	919	0.2
Fo	Forestdale silty clay loam	3,074	0.6
Fr	Frizzell silt loam	28,594	5.5
Ga	Gallion silt loam	13,740	2.7
Gb	Gallion silty clay loam	271	0.1
Gm	Groom very fine sandy loam	6,974	1.3
Go	Groom very fine sandy loam, occasionally flooded	11,713	2.3
Gp	Groom-Mollicy complex	3,036	0.6
Gs	Groom-Mollicy complex, occasionally flooded	1,624	0.3
Gu	Guyton silt loam	14,564	2.8
Gy	Guyton-Cascilla complex, frequently flooded	7,848	1.5
Ha	Haggerty loamy fine sand	1,530	0.3
He	Haggerty silty clay	1,404	0.3
Hg	Haggerty loamy fine sand, frequently flooded	474	0.1
Hh	Haggerty silty clay, frequently flooded	1,114	0.2
Hr	Hebert silt loam	57,873	11.2
Ht	Hebert silty clay loam	4,931	1.0
HY	Hebert and Perry soils, frequently flooded	4,980	1.0
Id	Idee-Forestdale complex	7,948	1.5
Ie	Idee-Goodwill complex	4,458	0.9
La	Lafe silt loam	347	0.1
Lb	Libuse silt loam, 1 to 3 percent slopes	8,603	1.7
Le	Libuse silt loam, 3 to 5 percent slopes	8,235	1.6
Lo	Litro clay	5,347	1.0
Lt	Litro clay, frequently flooded	5,375	1.0
Me	Mer Rouge silt loam	1,483	0.3
Mo	Mer Rouge silty clay loam	140	*
Mr	Mer Rouge-Gallion complex	9,649	1.9
Pc	Perry clay, 0 to 1 percent slopes	107,187	20.7
Pe	Perry clay, gently undulating	1,545	0.3
Pg	Perry clay, occasionally flooded	6,974	1.3
Pn	Portland silt loam	9,945	1.9
Po	Portland clay	18,035	3.5
Pr	Portland clay, occasionally flooded	5,313	1.0
Ra	Rilla silt loam, 0 to 1 percent slopes	16,280	3.1
Rb	Rilla silt loam, 1 to 3 percent slopes	1,944	0.4
Rh	Rilla-Hebert complex, gently undulating	15,524	3.0
Se	Sterlington silt loam, 0 to 1 percent slopes	21,363	4.1
Sr	Sterlington silt loam, 1 to 3 percent slopes	934	0.2
St	Sterlington-Hebert complex, gently undulating	16,745	3.2
To	Tillou silt loam	18,983	3.7
UB	Udalfs-Bussy association, 5 to 30 percent slopes	5,289	1.0
Wr	Wrightsville silt loam	6,679	1.3
Yo	Yorktown clay, frequently flooded	2,158	0.4
	Small water	5,646	1.1
	Large water	6,410	1.2
	Total	517,379	100.0

* Less than 0.1 percent.

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

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Map symbol and soil name	Cotton lint	Soybeans	Corn	Rice	Common bermuda-grass	Improved bermudagrass
	Lb	Bu	Bu	Bu	AUM*	AUM*
Bs------------------------ Bussy	450	18	60	---	5.0	10.0
Db------------------------ Debute	700	20	75	---	7.0	13.0
De------------------------ Debute	550	18	60	---	5.0	10.0
Dx------------------------ Dexter	700	30	80	---	7.0	13.0
Fo------------------------ Forestdale	475	30	50	130	6.5	12.0
Fr------------------------ Frizzell	425	15	50	70	5.0	9.0
Ga------------------------ Gallion	875	40	90	---	7.0	15.0
Gb------------------------ Gallion	825	40	85	---	7.0	13.0
Gm------------------------ Groom	---	10	---	70	4.0	6.0
Gp------------------------ Groom-Mollicy	---	10	---	70	4.0	6.0
Gu------------------------ Guyton	---	15	---	75	5.0	9.0
Gy------------------------ Guyton-Cascilla	---	---	---	---	5.0	---
Ha, He.------------------- Haggerty	---	10	---	---	2.0	4.0
Hg, Hh-------------------- Haggerty	---	---	---	---	2.0	---
Hr------------------------ Hebert	750	35	75	120	7.0	14.0
Ht------------------------ Hebert	650	35	70	120	6.5	13.5
HY------------------------ Hebert and Perry	---	---	---	---	5.0	---
Id------------------------ Idee-Forestdale	550	30	60	110	6.0	12.0
Ie------------------------ Idee-Goodwill	635	30	75	80	6.0	12.0
La------------------------ Lafe	---	---	---	---	3.0	---
Lb------------------------ Libuse	450	18	60	---	5.0	

See footnote at end of table.

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

Map symbol and soil name	Cotton lint	Soybeans	Corn	Rice	Common bermuda-grass	Improved bermudagrass
	Lb	Bu	Bu	Bu	AUM*	AUM*
Le-------------------------- Libuse	425	15	55	---	4.5	10.0
Lo-------------------------- Litro	---	---	20	90	4.0	7.0
Me-------------------------- Mer Rouge	900	40	95	---	8.0	16.0
Mo-------------------------- Mer Rouge	850	40	90	---	7.5	15.0
Mr-------------------------- Mer Rouge-Gallion	890	40	93	---	7.6	15.3
Pc, Pe---------------------- Perry	475	35	50	130	6.0	12.0
Pg-------------------------- Perry	425	30	45	120	5.5	---
Pn-------------------------- Portland	650	35	55	130	7.5	12.0
Po-------------------------- Portland	600	35	50	130	7.0	10.0
Pr-------------------------- Portland	550	30	45	115	6.5	---
Ra-------------------------- Rilla	875	40	90	120	7.0	14.0
Rb-------------------------- Rilla	850	37	85	100	7.0	13.5
Rh-------------------------- Rilla-Hebert	825	36	85	---	7.0	13.5
Se-------------------------- Sterlington	850	35	85	---	7.0	14.0
Sr-------------------------- Sterlington	825	30	80	---	7.0	13.5
St-------------------------- Sterlington-Hebert	805	30	80	---	7.0	14.0
To-------------------------- Tillou	425	15	50	70	5.0	9.0
UB:** Udalfs.						
Bussy-----------------------	---	---	---	---	4.5	7.0
Wr-------------------------- Wrightsville	---	15	---	80	4.0	---

* Animal-unit-month: The amount of forage or feed required to feed one animal (one cow, one horse, one mule, five sheep, or five goats) for 30 days.
** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas are excluded. Absence of an entry indicates no acreage]

Class	Total acreage	Major management concerns (Subclass)			
		Erosion (e)	Wetness (w)	Soil problem (s)	Climate (c)
		Acres	Acres	Acres	Acres
I	62,515	---	---	---	---
II	202,012	38,399	163,613	---	---
III	180,328	9,154	171,174	---	---
IV	32,883	6,873	26,010	---	---
V	19,791	---	19,791	---	---
VI	5,636	5,289	---	347	---
VII	2,158	---	2,158	---	---
VIII	---	---	---	---	---

TABLE 9.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Potential productivity: Common trees	Potential productivity: Site index	Trees to plant
Bs----- Bussy	2o7	Slight	Slight	Slight	Slight	Loblolly pine-----	90	Loblolly pine, slash pine, sweetgum, yellow-poplar.
						Slash pine-----	85	
						Sweetgum-----	90	
Db, De----- Debute	2o7	Slight	Slight	Slight	Slight	Loblolly pine-----	90	Loblolly pine, slash pine, sweetgum, cherrybark oak, yellow-poplar.
						Shortleaf pine-----	85	
						Sweetgum-----	90	
						Southern red oak-----	80	
						Cherrybark oak-----	85	
Dx----- Dexter	2o7	Slight	Slight	Slight	Slight	Loblolly pine-----	110	Loblolly pine, eastern cottonwood, cherrybark oak, sweetgum, willow oak.
						Eastern cottonwood-----	100	
						Cherrybark oak-----	90	
						Willow oak-----	90	
						Sweetgum-----	90	
						Nuttall oak-----	90	
Fo----- Forestdale	1w6	Slight	Severe	Moderate	Slight	Green ash-----	78	Green ash, eastern cottonwood, Nuttall oak, sweetgum, American sycamore.
						Eastern cottonwood-----	100	
						Cherrybark oak-----	94	
						Nuttall oak-----	99	
						Water oak-----	90	
						Willow oak-----	94	
						Sweetgum-----	100	
Fr----- Frizzell	2w8	Slight	Moderate	Slight	Slight	Loblolly pine-----	90	Loblolly pine, slash pine, sweetgum, yellow-poplar.
						Sweetgum-----	90	
						Water oak-----	---	
Ga, Gb----- Gallion	2o4	Slight	Slight	Slight	Slight	Green ash-----	80	Eastern cottonwood, American sycamore.
						Cherrybark oak-----	95	
						Sweetgum-----	83	
						Water oak-----	---	
						Pecan-----	---	
						American sycamore-----	---	
						Eastern cottonwood-----	100	
Gm, Go----- Groom	3w9	Slight	Moderate	Moderate	Moderate	Overcup oak-----	80	Green ash, Nuttall oak, loblolly pine, willow oak.
						Common persimmon-----	---	
						Loblolly pine-----	80	
						Willow oak-----	80	
						Water oak-----	80	
						Sweetgum-----	80	
						Cherrybark oak-----	80	
Gp,* Gs:*								
Groom-----	3w9	Slight	Moderate	Moderate	Moderate	Overcup oak-----	80	Green ash, Nuttall oak, loblolly pine, willow oak.
						Common persimmon-----	---	
						Loblolly pine-----	80	
						Willow oak-----	80	
						Water oak-----	80	
						Sweetgum-----	80	
						Cherrybark oak-----	80	
Mollicy-----	3w7	Moderate	Moderate	Moderate	Slight	Loblolly pine-----	85	Loblolly pine, willow oak, sweetgum, green ash.
						Sweetgum-----	85	
						Water oak-----	85	
						Willow oak-----	85	
						Common persimmon-----	---	
Gu----- Guyton	2w9	Slight	Severe	Moderate	Moderate	Loblolly pine-----	90	Loblolly pine, sweetgum.
						Slash pine-----	90	
						Sweetgum-----	---	
						Green ash-----	---	
						Southern red oak-----	---	
						Water oak-----	---	

TABLE 9.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Potential productivity: Common trees	Potential productivity: Site index	Trees to plant
Gy:* Guyton	2w9	Slight	Severe	Moderate	Moderate	Loblolly pine	90	Loblolly pine, sweetgum.
						Slash pine	90	
						Sweetgum	---	
						Green ash	---	
						Southern red oak	---	
						Water oak	---	
Cascilla	1w7	Slight	Moderate	Moderate	Slight	Cherrybark oak	112	Cherrybark oak, eastern cottonwood, loblolly pine, Nuttall oak, sweetgum, American sycamore, yellow-poplar.
						Eastern cottonwood	110	
						Loblolly pine	93	
						Nuttall oak	114	
						Water oak	104	
						Sweetgum	102	
						Yellow-poplar	115	
Ha, He, Hg, Hh Haggerty	2w6	Slight	Severe	Severe	Moderate	Water oak	---	Eastern cottonwood, American sycamore.
Hr, Ht Hebert	2w5	Slight	Moderate	Slight	Slight	Green ash	---	Eastern cottonwood, American sycamore.
						Eastern cottonwood	95	
						Cherrybark oak	95	
						Nuttall oak	90	
						Sweetgum	90	
						Pecan	---	
						Water oak	90	
						American sycamore	---	
HY:* Hebert	2w5	Slight	Moderate	Slight	Slight	Green ash	---	Eastern cottonwood, American sycamore.
						Eastern cottonwood	95	
						Cherrybark oak	95	
						Nuttall oak	90	
						Sweetgum	90	
						Pecan	---	
						Water oak	90	
						American sycamore	---	
Perry	3w6	Slight	Severe	Severe	Slight	Eastern cottonwood	85	Eastern cottonwood, sweetgum.
						Green ash	70	
						Sweetgum	---	
						Water oak	---	
						Water hickory	---	
Id:* Idee	2w5	Slight	Moderate	Slight	Slight	Cherrybark oak	105	Cherrybark oak, eastern cottonwood, sweetgum, water oak, yellow-poplar.
						Eastern cottonwood	100	
						Sweetgum	100	
						Water oak	95	
Forestdale	1w5	Slight	Severe	Moderate	Slight	Green ash	78	Green ash, eastern cottonwood, Nuttall oak, sweetgum, American sycamore.
						Eastern cottonwood	100	
						Cherrybark oak	94	
						Nuttall oak	99	
						Water oak	90	
						Willow oak	94	
						Sweetgum	100	
Ie:* Idee	2w5	Slight	Moderate	Slight	Slight	Cherrybark oak	105	Cherrybark oak, eastern cottonwood, sweetgum, water oak, yellow-poplar.
						Eastern cottonwood	100	
						Sweetgum	100	
						Water oak	95	

See footnote at end of table.

TABLE 9.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Potential productivity: Common trees	Potential productivity: Site index	Trees to plant
Ie:*								
Goodwill	2o4	Slight	Slight	Slight	Slight	Cherrybark oak	100	Eastern cottonwood, green ash, Nuttall oak, sweetgum, American sycamore, yellow-poplar.
						Eastern cottonwood	100	
						Green ash	80	
						Nuttall oak	95	
						Shumard oak	100	
						Sweetgum	95	
						Water oak	90	
						Willow oak	95	
Lb, Le: Libuse	3o7	Slight	Slight	Slight	Slight	Loblolly pine	83	Loblolly pine, sweetgum, yellow-poplar.
						Sweetgum	80	
Lo: Litro	3w9	Slight	Moderate	Severe	Moderate	Overcup oak	80	Sweetgum, green ash, Nuttall oak, loblolly pine.
						Water hickory	85	
						Baldcypress	70	
						Honeylocust	80	
						Water tupelo	70	
						Common persimmon	80	
Lt: Litro	4w9	Slight	Severe	Severe	Moderate	Overcup oak	75	Baldcypress, green ash.
						Water hickory	75	
						Baldcypress	70	
						Honeylocust	70	
						Water tupelo	60	
						Common persimmon	70	
Me, Mo: Mer Rouge	2o4	Slight	Slight	Slight	Slight	Green ash	70	Eastern cottonwood, American sycamore.
						Eastern cottonwood	90	
						Pecan	---	
						Sweetgum	95	
						American sycamore	---	
Mr:*								
Mer Rouge	2o4	Slight	Slight	Slight	Slight	Green ash	70	Eastern cottonwood, American sycamore.
						Eastern cottonwood	90	
						Pecan	---	
						Sweetgum	95	
						American sycamore	---	
Gallion	2o4	Slight	Slight	Slight	Slight	Green ash	80	Eastern cottonwood, American sycamore.
						Cherrybark oak	95	
						Sweetgum	83	
						Water oak	---	
						Pecan	---	
						American sycamore	---	
						Eastern cottonwood	100	
Pc, Pe, Pg: Perry	2w6	Slight	Severe	Moderate	Moderate	Cherrybark oak	---	Eastern cottonwood, sweetgum, green ash, water oak.
						Eastern cottonwood	90	
						Green ash	72	
						Sweetgum	92	
						Water oak	---	
						Pecan	---	
						Water hickory	---	
Pn, Po, Pr: Portland	2w6	Slight	Severe	Moderate	Moderate	Green ash	80	Green ash, eastern cottonwood, sweetgum, American sycamore.
						Eastern cottonwood	100	
						Sweetgum	90	
Ra, Rb: Rilla	2o4	Slight	Slight	Slight	Slight	Eastern cottonwood	100	Eastern cottonwood, American sycamore.
						Cherrybark oak	100	
						Nuttall oak	85	
						Sweetgum	100	
						Pecan	---	
						American sycamore	---	

See footnote at end of table.

TABLE 9.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Trees to plant
Rh:*								
Rilla-------------	2o4	Slight	Slight	Slight	Slight	Eastern cottonwood--	100	Eastern cottonwood, American sycamore.
						Cherrybark oak------	100	
						Nuttall oak---------	85	
						Sweetgum------------	100	
						Pecan---------------	---	
						American sycamore---	---	
Hebert------------	2w5	Slight	Moderate	Slight	Slight	Green ash-----------	---	Eastern cottonwood, American sycamore.
						Eastern cottonwood--	95	
						Cherrybark oak------	95	
						Nuttall oak---------	90	
						Sweetgum------------	90	
						Pecan---------------	---	
						Water oak-----------	90	
						American sycamore---	---	
Se, Sr------------- Sterlington	2o4	Slight	Slight	Slight	Slight	Green ash-----------	75	Eastern cottonwood.
						Eastern cottonwood--	---	
						Cherrybark oak------	95	
						Water oak-----------	90	
						Pecan---------------	---	
						Sweetgum------------	90	
St:*								
Sterlington-------	2o4	Slight	Slight	Slight	Slight--	Green ash-----------	75	Eastern cottonwood.
						Eastern cottonwood--	---	
						Cherrybark oak------	95	
						Water oak-----------	90	
						Pecan---------------	---	
						Sweetgum------------	90	
Hebert------------	2w5	Slight	Moderate	Slight	Slight--	Green ash-----------	---	Eastern cottonwood, American sycamore.
						Eastern cottonwood--	95	
						Cherrybark oak------	95	
						Nuttall oak---------	90	
						Sweetgum------------	90	
						Pecan---------------	---	
						Water oak-----------	90	
						American sycamore---	---	
To----------------- Tillou	2w8	Slight	Moderate	Moderate	Moderate	Loblolly pine-------	86	Loblolly pine, slash pine, water oak, sweetgum.
						Water oak-----------	86	
						Sweetgum------------	86	
UB:* Udalfs.								
Bussy-------------	2o7	Slight	Slight	Slight	Slight	Loblolly pine-------	90	Loblolly pine, slash pine, sweetgum, yellow-poplar.
						Slash pine----------	85	
						Sweetgum------------	90	
Wr----------------- Wrightsville	3w9	Slight	Severe	Moderate	Moderate	Loblolly pine-------	80	Loblolly pine, sweetgum, water oak, willow oak.
						Sweetgum------------	80	
						Water oak-----------	80	
Yo----------------- Yorktown	4w9	Slight	Severe	Severe	Severe	Baldcypress---------	70	Baldcypress, green ash, water tupelo.
						Water tupelo--------	---	
						Water hickory-------	---	
						Green ash-----------	---	

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--RECREATIONAL DEVELOPMENT

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

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Ad: Allemands	Severe: flooding, percs slowly.	Severe: excess humus, percs slowly.	Severe: excess humus, percs slowly.	Severe: excess humus.	Severe: excess humus.
Bs: Bussy	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: erodes easily.	Slight.
Db: Debute	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness.
De: Debute	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: wetness.
Dx: Dexter	Slight	Slight	Moderate: slope.	Severe: erodes easily.	Slight.
Fo: Forestdale	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
Fr: Frizzell	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
Ga: Gallion	Slight	Slight	Slight	Slight	Slight.
Gb: Gallion	Slight	Slight	Slight	Slight	Slight.
Gm, Go: Groom	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, erodes easily.	Severe: wetness.
Gp:*					
Groom	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, erodes easily.	Severe: wetness.
Mollicy	Severe: flooding.	Moderate: wetness, percs slowly.	Moderate: slope, wetness.	Severe: erodes easily.	Moderate: wetness.
Gs:*					
Groom	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness, erodes easily.	Severe: wetness, flooding.
Mollicy	Severe: flooding.	Moderate: wetness, percs slowly.	Moderate: wetness, flooding.	Severe: erodes easily.	Moderate: wetness, flooding.
Gu: Guyton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Gy:*					
Guyton	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Cascilla	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
Ha Haggerty	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
He Haggerty	Severe: too clayey, wetness, flooding.	Severe: too clayey, wetness.	Severe: too clayey, wetness.	Severe: too clayey, wetness.	Severe: too clayey, wetness.
Hg Haggerty	Severe: flooding, wetness.	Severe: wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: flooding, wetness.
Hh Haggerty	Severe: too clayey, flooding, wetness.	Severe: too clayey, wetness.	Severe: flooding, too clayey, wetness.	Severe: too clayey, wetness.	Severe: too clayey, flooding, wetness.
Hr Hebert	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
Ht Hebert	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
HY:*					
Hebert	Severe: flooding.	Moderate: wetness, percs slowly.	Severe: flooding.	Severe: erodes easily.	Severe: flooding.
Perry	Severe: flooding, wetness, percs slowly.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey, wetness, flooding.	Severe: wetness, too clayey.	Severe: wetness, flooding, too clayey.
Id:*					
Idee	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: erodes easily.	Moderate: wetness.
Forestdale	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
Ie:*					
Idee	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: erodes easily.	Moderate: wetness.
Goodwill	Slight	Slight	Moderate: slope.	Severe: erodes easily.	Slight.
La Lafe	Severe: wetness, percs slowly, excess sodium.	Severe: wetness, excess sodium, percs slowly.	Severe: wetness, percs slowly, excess sodium.	Severe: wetness.	Severe: excess sodium, wetness.
Lb, Le Libuse	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: slope, percs slowly, wetness.	Severe: erodes easily.	Moderate: wetness.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Lo: Litro	Severe: flooding, wetness, percs slowly.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey, wetness.	Severe: wetness, too clayey.	Severe: wetness, too clayey.
Lt: Litro	Severe: flooding, wetness, percs slowly.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey, wetness, flooding.	Severe: wetness, too clayey.	Severe: wetness, flooding, too clayey.
Me: Mer Rouge	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly.	Slight	Slight.
Mo: Mer Rouge	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly.	Slight	Slight.
Mr:*					
Mer Rouge	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: percs slowly.	Slight	Slight.
Gallion	Slight	Slight	Slight	Severe: erodes easily.	Slight.
Pc, Pe: Perry	Severe: wetness, percs slowly, flooding.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey, wetness.	Severe: wetness, too clayey.	Severe: wetness, too clayey.
Pg: Perry	Severe: flooding, wetness, percs slowly.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey, wetness.	Severe: wetness, too clayey.	Severe: wetness, too clayey.
Pn: Portland	Severe: wetness, percs slowly, flooding.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Po: Portland	Severe: wetness, percs slowly, flooding.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey, wetness.	Severe: wetness, too clayey.	Severe: wetness, too clayey.
Pr: Portland	Severe: flooding, wetness, percs slowly.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey, wetness.	Severe: wetness, too clayey.	Severe: wetness, too clayey.
Ra: Rilla	Slight	Slight	Slight	Slight	Slight.
Rb: Rilla	Slight	Slight	Moderate: slope.	Severe: erodes easily.	Slight.
Rh:*					
Rilla	Slight	Slight	Slight	Severe: erodes easily.	Slight.
Hebert	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness.
Se: Sterlington	Slight	Slight	Slight	Slight	Slight.
Sr: Sterlington	Slight	Slight	Moderate: slope.	Severe: erodes easily.	Slight.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
St:*					
Sterlington	Slight	Slight	Slight	Severe: erodes easily.	Slight.
Hebert	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
To Tillou	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, erodes easily.	Severe: wetness.
UB:* Udalfs.					
Bussy	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Slight.
Wr Wrightsville	Severe: wetness, percs slowly, flooding.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
Yo Yorktown	Severe: flooding, ponding, percs slowly.	Severe: ponding, too clayey, excess humus.	Severe: too clayey, excess humus, ponding.	Severe: ponding, too clayey, excess humus.	Severe: ponding, flooding, too clayey.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--WILDLIFE HABITAT

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

Map symbol and soil name	Potential for habitat elements								Potential as habitat		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Ad------------------ Allemands	Poor	Fair	Fair	Fair	---	Fair	Good	Very poor.	Fair	Fair	Good
Bs------------------ Bussy	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Db------------------ Debute	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
De------------------ Debute	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Dx------------------ Dexter	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Fo------------------ Forestdale	Fair	Fair	Good	Fair	---	Fair	Good	Good	Fair	Fair	Good
Fr------------------ Frizzell	Fair	Good	Good	---	Good	Good	Fair	Fair	Good	Good	Fair
Ga, Gb-------------- Gallion	Good	Good	Good	Good	---	Good	Poor	Very poor.	Good	Good	Very poor.
Gm, Go-------------- Groom	Poor	Fair	Poor	Fair	---	Fair	Fair	Good	Fair	Fair	Fair
Gp.* Gs:*											
Groom--------------	Poor	Fair	Poor	Fair	---	Fair	Fair	Good	Fair	Fair	Fair
Mollicy------------	Poor	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair	Fair	Poor
Gu------------------ Guyton	Fair	Fair	Fair	Fair	Good	Good	Good	Good	Fair	Fair	Good
Gy:*											
Guyton-------------	Fair	Fair	Fair	Fair	---	Fair	Good	Good	Fair	Fair	Good
Cascilla-----------	Poor	Fair	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
Ha, He, Hg, Hh------ Haggerty	Poor	Fair	Fair	Fair	Poor	Poor	Fair	Very poor.	Fair	Fair	Very poor.
Hr, Ht-------------- Hebert	Good	Good	Good	Good	---	Good	Fair	Fair	Good	Good	Fair
HY:*											
Hebert-------------	Good	Good	Good	Good	---	Good	Fair	Fair	Good	Good	Fair
Perry--------------	Poor	Fair	Fair	Fair	---	Fair	Fair	Fair	Fair	Fair	Fair
Id:*											
Idee---------------	Fair	Good	Good	Good	---	Good	Fair	Fair	Good	Good	Fair
Forestdale---------	Fair	Fair	Good	Fair	---	Fair	Good	Good	Fair	Fair	Good
Ie:*											
Idee---------------	Fair	Good	Good	Good	---	Good	Fair	Fair	Good	Good	Fair
Goodwill-----------	Good	Good	Good	Good	---	Good	Poor	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 11.--WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat: Openland wildlife	Woodland wildlife	Wetland wildlife
La-----------------Lafe	Very poor.	Very poor.	Poor	Poor	Poor	Poor	Poor	Good	Very poor.	Poor	Fair
Lb, Le-------------Libuse	Good	Good	Good	---	Good	Good	Poor	Poor	Good	Good	Poor
Lo-----------------Litro	Poor	Fair	Good	Fair	---	Fair	Good	Good	Fair	Fair	Good
Lt-----------------Litro	Poor	Fair	Fair	Fair	---	Fair	Good	Good	Poor	Fair	Good
Me, Mo-------------Mer Rouge	Good	Good	Good	Good	---	Good	Poor	Poor	Good	Good	Poor
Mr:*											
Mer Rouge-----------	Good	Good	Good	Good	---	Good	Poor	Poor	Good	Good	Poor
Gallion-------------	Good	Good	Good	Good	---	Good	Poor	Very poor.	Good	Good	Very poor.
Pc, Pe-------------Perry	Fair	Fair	Fair	Good	---	Fair	Good	Good	Fair	Good	Good
Pg-----------------Perry	Poor	Fair	Fair	Fair	---	Fair	Fair	Fair	Fair	Fair	Fair
Pn, Po, Pr---------Portland	Good	Good	Good	Good	---	Good	Good	Good	Good	Good	Good
Ra, Rb-------------Rilla	Good	Good	Good	Good	---	Good	Poor	Very poor.	Good	Good	Very poor.
Rh:*											
Rilla---------------	Good	Good	Good	Good	---	Good	Poor	Very poor.	Good	Good	Very poor.
Hebert--------------	Good	Good	Good	Good	---	Good	Fair	Fair	Good	Good	Fair
Se, Sr-------------Sterlington	Good	Good	Good	Good	---	Good	Poor	Very poor.	Good	Good	Very poor.
St:*											
Sterlington---------	Good	Good	Good	Good	---	Good	Poor	Very poor.	Good	Good	Very poor.
Hebert--------------	Good	Good	Good	Good	---	Good	Fair	Fair	Good	Good	Fair
To-----------------Tillou	Fair	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
UB:*											
Udalfs--------------	Poor	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Good	Very poor.
Bussy---------------	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Wr-----------------Wrightsville	Fair	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
Yo-----------------Yorktown	Very poor.	Very poor.	Very poor.	Poor	Poor	Poor	Poor	Good	Very poor.	Very poor.	Fair

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--BUILDING SITE DEVELOPMENT

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

Map symbol and soil name	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Ad----------------- Allemands	Severe: excess humus.	Severe: flooding, shrink-swell, low strength.	Severe: flooding, low strength.	Severe: low strength.	Severe: excess humus.
Bs----------------- Bussy	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: low strength.	Slight.
Db----------------- Debute	Severe: wetness.	Moderate: wetness, shrink-swell.	Moderate: wetness, shrink-swell.	Severe: low strength.	Moderate: wetness.
De----------------- Debute	Severe: wetness.	Moderate: wetness, shrink-swell.	Moderate: wetness, shrink-swell, slope.	Severe: low strength.	Moderate: wetness.
Dx----------------- Dexter	Slight-----------	Slight-----------	Moderate: slope.	Severe: low strength.	Slight.
Fo----------------- Forestdale	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, wetness, low strength.	Severe: wetness.
Fr----------------- Frizzell	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
Ga, Gb------------- Gallion	Slight-----------	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
Gm----------------- Groom	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness.	Severe: wetness.
Go----------------- Groom	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness.
Gp:*					
Groom-------------	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness.	Severe: wetness.
Mollicy-----------	Severe: wetness.	Severe: flooding.	Severe: flooding.	Severe: low strength.	Moderate: wetness.
Gs:*					
Groom-------------	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness.
Mollicy-----------	Severe: wetness.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Moderate: wetness, flooding.
Gu----------------- Guyton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.

See footnote at end of table.

TABLE 12.--BUILDING SITE DEVELOPMENT --Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Gy:*					
Guyton	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: low strength, wetness, flooding.	Severe: wetness,
Cascilla	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Severe: flooding.
Ha Haggerty	Severe: cutbanks cave, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness.
He Haggerty	Severe: cutbanks cave, wetness.	Severe: wetness, flooding,	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness.
Hg Haggerty	Severe: flooding, wetness, cutbanks cave.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.
Hh Haggerty	Severe: flooding, wetness, cutbanks cave.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: too clayey, flooding, wetness.
Hr, Ht Hebert	Severe: wetness.	Moderate: wetness, shrink-swell.	Moderate: wetness, shrink-swell.	Severe: low strength.	Moderate: wetness.
Hy:*					
Hebert	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: low strength,	Severe: flooding.
Perry	Severe: wetness, flooding.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding, too clayey.
Id:*					
Idee	Severe: wetness.	Moderate: wetness, shrink-swell.	Moderate: wetness, shrink-swell.	Severe: low strength.	Moderate: wetness.
Forestdale	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, wetness, low strength.	Severe: wetness.
Ie:*					
Idee	Severe: wetness.	Moderate: wetness, shrink-swell.	Moderate: wetness, shrink-swell.	Severe: low strength.	Moderate: wetness.
Goodwill	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
La Lafe	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: excess sodium, wetness.
Lb Libuse	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: low strength.	Moderate: wetness.
Le Libuse	Severe: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Severe: low strength.	Moderate: wetness.

See footnote at end of table.

TABLE 12.--BUILDING SITE DEVELOPMENT-Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Lo----------------- Litro	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, wetness.	Severe: wetness, too clayey.
Lt----------------- Litro	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding, too clayey.
Me, Mo------------- Mer Rouge	Moderate: wetness.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
Mr:*					
Mer Rouge---------	Moderate: wetness.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
Gallion-----------	Slight-----------	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
Pc, Pe------------- Perry	Severe: wetness.	Severe: wetness, shrink-swell, flooding.	Severe: wetness, shrink-swell, flooding.	Severe: low strength, wetness.	Severe: wetness, too clayey.
Pg----------------- Perry	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, wetness, flooding.	Severe: wetness, too clayey.
Pn----------------- Portland	Severe: wetness.	Severe: wetness, shrink-swell, flooding.	Severe: wetness, shrink-swell, flooding.	Severe: low strength, wetness.	Severe: wetness.
Po----------------- Portland	Severe: wetness.	Severe: wetness, shrink-swell, flooding.	Severe: wetness, shrink-swell, flooding.	Severe: low strength, wetness.	Severe: wetness, too clayey.
Pr----------------- Portland	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, wetness, flooding.	Severe: wetness, too clayey.
Ra, Rb------------- Rilla	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
Rh:*					
Rilla-------------	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
Hebert------------	Severe: wetness.	Moderate: wetness, shrink-swell.	Moderate: wetness, shrink-swell.	Severe: low strength.	Moderate: wetness.
Se, Sr------------- Sterlington	Slight-----------	Slight-----------	Slight-----------	Slight-----------	Slight.
St:*					
Sterlington-------	Slight-----------	Slight-----------	Slight-----------	Slight-----------	Slight.
Hebert------------	Severe: wetness.	Moderate: wetness, shrink-swell.	Moderate: wetness, shrink-swell.	Severe: low strength.	Moderate: wetness.

See footnote at end of table.

TABLE 12.--BUILDING SITE DEVELOPMENT-Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
To: Tillou	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
UB:* Udalfs.					
Bussy	Severe: wetness.	Moderate: wetness.	Moderate: wetness, slope.	Severe: low strength.	Slight.
Wr: Wrightsville	Severe: wetness.	Severe: wetness, shrink-swell, flooding.	Severe: wetness, shrink-swell, flooding.	Severe: low strength, wetness, shrink-swell.	Severe: wetness.
Yo: Yorktown	Severe: ponding.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding, too clayey.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Ad------------------ Allemands	Severe: wetness, percs slowly.	Severe: wetness, seepage, excess humus.	Severe: wetness, too clayey, excess humus.	Severe: seepage, wetness.	Poor: too clayey, wetness, excess humus.
Bs------------------ Bussy	Severe: wetness, percs slowly.	Severe: wetness.	Moderate: wetness, too clayey.	Moderate: wetness.	Fair: too clayey, wetness.
Db, De-------------- Debute	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Fair: wetness.
Dx------------------ Dexter	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Good.
Fo------------------ Forestdale	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Fr------------------ Frizzell	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
Ga, Gb-------------- Gallion	Moderate: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight------------	Fair: too clayey.
Gm------------------ Groom	Severe: wetness, percs slowly.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Go------------------ Groom	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Gp:*					
Groom---------------	Severe: wetness, percs slowly.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Mollicy-------------	Severe: wetness, percs slowly.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
Gs:*					
Groom---------------	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Mollicy-------------	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
Gu------------------ Guyton	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.

See footnote at end of table.

TABLE 13.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Gy:*					
Guyton	Severe: wetness, percs slowly, flooding.	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: wetness, flooding.	Poor: wetness.
Cascilla	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.
Ha, He: Haggerty	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
Hg, Hh: Haggerty	Severe: flooding, wetness, poor filter.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Hr, Ht: Hebert	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
HY:*					
Hebert	Severe: wetness, percs slowly, flooding.	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: wetness, flooding.	Fair: too clayey, wetness.
Perry	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
Id:*					
Idee	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
Forestdale	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Ie:*					
Idee	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
Goodwill	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
La: Lafe	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, excess sodium.	Severe: wetness.	Poor: wetness, excess sodium.
Lb, Le: Libuse	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Lo: Litro	Severe: wetness, percs slowly.	Severe: flooding, wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Lt: Litro	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.

See footnote at end of table.

TABLE 13.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Me, Mo----------- Mer Rouge	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
Mr:*					
Mer Rouge-----------	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
Gallion------------	Moderate: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight-----------	Fair: too clayey.
Pc, Pe------------- Perry	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Pg----------------- Perry	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
Pn, Po------------- Portland	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Pr----------------- Portland	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
Ra----------------- Rilla	Moderate: wetness, percs slowly.	Moderate: seepage, wetness.	Severe: wetness.	Moderate: wetness.	Poor: thin layer.
Rb----------------- Rilla	Moderate: wetness, percs slowly.	Moderate: seepage, slope, wetness.	Severe: wetness.	Moderate: wetness.	Poor: thin layer.
Rh:*					
Rilla--------------	Moderate: wetness, percs slowly.	Moderate: seepage, wetness.	Severe: wetness.	Moderate: wetness.	Poor: thin layer.
Hebert-------------	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
Se----------------- Sterlington	Moderate: percs slowly.	Moderate: seepage.	Slight-----------	Slight-----------	Good.
Sr----------------- Sterlington	Moderate: percs slowly.	Moderate: seepage, slope.	Slight-----------	Slight-----------	Good.
St:*					
Sterlington--------	Moderate: percs slowly.	Moderate: seepage.	Slight-----------	Slight-----------	Good.
Hebert-------------	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
To----------------- Tillou	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.

See footnote at end of table.

TABLE 13.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
UB:* Udalfs.					
Bussy	Severe: wetness, percs slowly.	Severe: slope, wetness.	Moderate: wetness, too clayey.	Moderate: wetness.	Fair: too clayey, wetness.
Wr: Wrightsville	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Yo: Yorktown	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding, too clayey.	Severe: flooding, ponding.	Poor: too clayey, hard to pack, ponding.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," "probable," and "improbable." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
Ad: Allemands	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
Bs: Bussy	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Db, De: Debute	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Dx: Dexter	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
Fo: Forestdale	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
Fr: Frizzell	Fair: thin layer, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Ga: Gallion	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Gb: Gallion	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Gm, Go: Groom	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Gp,* Gs:*				
Groom	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Mollicy	Fair: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
Gu: Guyton	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Gy:*				
Guyton	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Cascilla	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Ha: Haggerty	Poor: wetness.	Probable	Improbable: excess fines.	Poor: wetness.
He: Haggerty	Poor: wetness.	Probable	Improbable: excess fines.	Poor: too clayey, wetness.
Hg: Haggerty	Poor: wetness.	Probable	Improbable: excess fines.	Poor: wetness.

See footnote at end of table.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
Hh------------------- Haggerty	Poor: wetness.	Probable-------------	Improbable: excess fines.	Poor: too clayey, wetness.
Hr------------------- Hebert	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Ht------------------- Hebert	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
HY:*				
Hebert---------------	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Perry----------------	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Id:*				
Idee-----------------	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Forestdale-----------	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
Ie:*				
Idee-----------------	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Goodwill-------------	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Good.
La------------------- Lafe	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.
Lb, Le--------------- Libuse	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Good.
Lo, Lt--------------- Litro	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Me------------------- Mer Rouge	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim.
Mo------------------- Mer Rouge	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, area reclaim.
Mr:*				
Mer Rouge------------	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim.
Gallion--------------	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.

See footnote at end of table.

TABLE 14.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
Pc, Pe, Pg: Perry	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Pn: Portland	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Po, Pr: Portland	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Ra, Rb: Rilla	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
Rh:*				
Rilla	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
Hebert	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Se, Sr: Sterlington	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
St:*				
Sterlington	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
Hebert	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
To: Tillou	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
UB:*				
Udalfs.				
Bussy	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Wr: Wrightsville	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
Yo: Yorktown	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation]

Map symbol and soil name	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Ad: Allemands	Slight	Severe: piping, excess humus.	Percs slowly, subsides.	Percs slowly.	Percs slowly.	Wetness, percs slowly.
Bs: Bussy	Moderate: seepage, slope.	Severe: piping.	Percs slowly, slope.	Wetness, percs slowly, rooting depth.	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth, percs slowly.
Db: Debute	Moderate: seepage.	Moderate: piping, wetness.	Percs slowly	Wetness, percs slowly, rooting depth.	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth, percs slowly.
De: Debute	Moderate: seepage, slope.	Moderate: piping, wetness.	Percs slowly, slope.	Wetness, percs slowly, rooting depth.	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth, percs slowly.
Dx: Dexter	Severe: seepage.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
Fo: Forestdale	Slight	Severe: piping, wetness.	Percs slowly	Wetness, percs slowly, erodes easily.	Wetness, percs slowly, erodes easily.	Wetness, erodes easily, percs slowly.
Fr: Frizzell	Moderate: seepage.	Severe: piping, wetness.	Percs slowly	Wetness, percs slowly, erodes easily.	Erodes easily, wetness.	Erodes easily, percs slowly.
Ga: Gallion	Moderate: seepage.	Moderate: thin layer, piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
Gb: Gallion	Moderate: seepage.	Moderate: thin layer, piping.	Deep to water	Favorable	Favorable	Favorable.
Gm: Groom	Slight	Severe: wetness.	Favorable	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
Go: Groom	Slight	Severe: wetness.	Flooding	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
Gp:*						
Groom	Slight	Severe: wetness.	Favorable	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily
Mollicy	Slight	Severe: wetness.	Favorable	Wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
Gs:*						
Groom	Slight	Severe: wetness.	Flooding	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Wetness, erodes easily
Mollicy	Slight	Severe: wetness.	Flooding	Wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
Gu: Guyton	Moderate: seepage.	Severe: piping, wetness.	Percs slowly	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily percs slowly.
Gy:*						
Guyton	Moderate: seepage.	Severe: piping, wetness.	Percs slowly	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily percs slowly.

See footnote at end of table.

TABLE 15.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
ly:*						
Cascilla----------	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily, flooding.	Erodes easily	Erodes easily.
la---------------- Haggerty	Severe: seepage.	Severe: piping, wetness.	Cutbanks cave	Wetness, fast intake.	Wetness---------	Wetness.
le---------------- Haggerty	Severe: seepage.	Severe: piping, wetness.	Cutbanks cave	Wetness, slow intake.	Wetness---------	Wetness.
lg, Hh------------ Haggerty	Severe: seepage.	Severe: piping, wetness.	Flooding--------	Flooding, wetness.	Wetness---------	Wetness.
lr---------------- Hebert	Moderate: seepage.	Severe: thin layer, wetness.	Favorable-------	Wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
lt---------------- Hebert	Moderate: seepage.	Severe: thin layer, wetness.	Favorable-------	Wetness---------	Erodes easily, wetness.	Erodes easily.
lY:*						
Hebert------------	Moderate: seepage.	Severe: thin layer, wetness.	Flooding--------	Wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
Perry-------------	Slight----------	Severe: hard to pack, wetness.	Percs slowly, flooding.	Wetness, slow intake, percs slowly.	Wetness, percs slowly.	Wetness, rooting depth, percs slowly.
[d:*						
Idee--------------	Moderate: seepage.	Severe: wetness.	Favorable-------	Wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
Forestdale--------	Slight----------	Severe: piping, wetness.	Percs slowly----	Wetness, percs slowly, erodes easily.	Wetness, percs slowly, erodes easily.	Wetness, erodes easily, percs slowly.
[e:*						
Idee--------------	Moderate: seepage.	Severe: wetness.	Favorable-------	Wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
Goodwill----------	Moderate: seepage.	Moderate: thin layer, piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
La---------------- Lafe	Slight----------	Severe: wetness, excess sodium.	Percs slowly, excess sodium.	Wetness, droughty, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, excess sodium, erodes easily.
Lb---------------- Libuse	Moderate: seepage.	Moderate: thin layer, piping, wetness.	Percs slowly----	Percs slowly, rooting depth, wetness.	Erodes easily, rooting depth, wetness.	Erodes easily, rooting depth.
Le---------------- Libuse	Moderate: seepage, slope.	Moderate: thin layer, piping, wetness.	Percs slowly, slope.	Percs slowly, rooting depth, slope, wetness.	Erodes easily, rooting depth, wetness.	Erodes easily, rooting depth.
Lo---------------- Litro	Slight----------	Severe: hard to pack, wetness.	Percs slowly----	Wetness, slow intake, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
Lt---------------- Litro	Slight----------	Severe: hard to pack, wetness.	Percs slowly, flooding.	Wetness, slow intake, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.

TABLE 15.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
Me------------------ Mer Rouge	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
Mo------------------ Mer Rouge	Moderate: seepage.	Severe: piping.	Deep to water	Favorable------	Favorable------	Favorable.
Mr:*						
Mer Rouge---------	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
Gallion-----------	Moderate: seepage.	Moderate: thin layer, piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
Pc, Pe------------ Perry	Slight----------	Severe: hard to pack, wetness.	Percs slowly---	Wetness, slow intake, percs slowly.	Wetness, percs slowly.	Wetness, rooting depth, percs slowly.
Pg---------------- Perry	Slight----------	Severe: hard to pack, wetness.	Percs slowly, flooding.	Wetness, slow intake, percs slowly.	Wetness, percs slowly.	Wetness, rooting depth, percs slowly.
Pn---------------- Portland	Slight----------	Severe: hard to pack, wetness.	Percs slowly---	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Po---------------- Portland	Slight----------	Severe: hard to pack, wetness.	Percs slowly---	Wetness, slow intake, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
Pr---------------- Portland	Slight----------	Severe: hard to pack, wetness.	Percs slowly, flooding.	Wetness, slow intake, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
Ra, Rb------------ Rilla	Moderate: seepage.	Severe: thin layer.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
Rh:*						
Rilla-------------	Moderate: seepage.	Severe: thin layer.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
Hebert------------	Moderate: seepage.	Severe: thin layer, wetness.	Favorable------	Wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
Se, Sr------------ Sterlington	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
St:*						
Sterlington-------	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
Hebert------------	Moderate: seepage.	Severe: thin layer, wetness.	Favorable------	Wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
To---------------- Tillou	Moderate: seepage.	Severe: wetness.	Favorable------	Wetness, percs slowly.	Erodes easily, wetness.	Wetness, erodes easily.
UB:*						
Udalfs.						
Bussy-------------	Moderate: seepage, slope.	Severe: piping.	Percs slowly, slope.	Wetness, percs slowly, rooting depth.	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth, percs slowly.
Wr---------------- Wrightsville	Slight----------	Severe: hard to pack, wetness.	Percs slowly---	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.

See footnote at end of table.

TABLE 15.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Yo----------------- Yorktown	Slight---------	Severe: hard to pack, ponding.	Ponding, percs slowly, flooding.	Ponding, slow intake, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated. Some soils have Unified classifications and USDA textures that are supplementary to those shown. In general, the dominant classifications and textures are shown, and the others are inferred]

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
Ad: Allemands	0-36	Muck	PT	A-8	0	---	---	---	---	---	---
	36-65	Clay, very fine sandy loam, silty clay.	CH, CL, ML, MH	A-7-6, A-6, A-4	0	100	100	85-95	75-95	30-75	6-45
Bs: Bussy	0-4	Silt loam	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	<27	NP-12
	4-35	Silt loam, silty clay loam.	CL, CL-ML, ML	A-6, A-4	0	100	100	95-100	90-100	20-35	3-15
	35-56	Silt loam, silty clay loam.	CL, CL-ML, ML	A-6, A-4	0	100	100	95-100	85-95	25-40	3-25
	56-65	Silt loam, silty clay loam.	CL, CL-ML, ML	A-6, A-4	0	100	100	95-100	85-95	25-40	3-25
Db: Debute	0-10	Silt loam	CL, CL-ML, ML	A-4	0	100	100	95-100	85-100	<27	NP-10
	10-32	Silt loam, silty clay loam.	CL	A-6, A-7-6	0	100	100	95-100	85-100	30-43	12-22
	32-70	Silt loam, loam, sandy clay loam.	CL	A-6	0	100	100	90-100	60-100	30-40	11-20
De: Debute	0-8	Silt loam	CL, CL-ML, ML	A-4	0	100	100	95-100	85-100	<27	NP-10
	8-27	Silt loam, silty clay loam.	CL	A-6, A-7-6	0	100	100	95-100	85-100	30-43	12-22
	27-90	Silt loam, loam, sandy clay loam.	CL	A-6	0	100	100	90-100	60-100	30-40	11-20
Dx: Dexter	0-7	Silt loam	ML, SM, CL-ML, SM-SC	A-4	0	100	100	85-100	45-75	<25	NP-4
	7-48	Silty clay loam, clay loam, silt loam.	CL	A-6, A-4	0	100	100	90-100	70-90	28-40	8-18
	48-87	Sandy clay loam, fine sandy loam, loamy fine sand.	SC, SM, CL, ML	A-6, A-4	0	100	100	75-95	35-60	<38	NP-16
Fo: Forestdale	0-6	Silty clay loam	CL, CH	A-6, A-7	0	100	100	95-100	90-100	30-58	12-30
	6-27	Silty clay, clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	90-100	40-65	20-40
	27-60	Silty clay loam, silt loam, clay loam.	CL, CL-ML	A-6, A-7, A-4	0	100	100	95-100	75-100	20-50	5-30
Fr: Frizzell	0-48	Silt loam	CL-ML, ML, CL	A-4	0	100	100	90-100	65-90	<30	NP-10
	48-54	Silty clay loam, silt loam, loam.	CL	A-6	0	100	100	90-100	70-95	31-40	11-19
	54-76	Silt loam, silty clay loam, loam.	CL	A-6, A-4	0	100	100	90-100	65-95	28-40	8-19
Ga: Gallion	0-7	Silt loam	ML, CL-ML, CL	A-4, A-6	0	100	100	100	90-100	<28	NP-11
	7-19	Silt loam, silty clay loam, clay loam.	CL	A-6	0	100	100	100	90-100	28-40	11-17
	19-60	Stratified silty clay loam to very fine sandy loam.	CL, CL-ML	A-6, A-4	0	100	100	100	90-100	23-34	4-12
Gb: Gallion	0-14	Silty clay loam	CL	A-6	0	100	100	100	90-100	33-40	15-20
	14-60	Silt loam, silty clay loam, clay loam.	CL	A-6	0	100	100	100	90-100	28-40	11-17

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Gm---------------- Groom	0-5	Very fine sandy loam.	ML, CL-ML, CL	A-4, A-6	0	100	100	90-100	75-95	<40	3-20
	5-12	Silt loam, loam, very fine sandy loam.	CL, CL-ML	A-4, A-6	0	100	100	90-100	75-95	<40	5-22
	12-78	Silty clay loam, loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	80-95	18-46	11-22
Go---------------- Groom	0-4	Very fine sandy loam.	ML, CL-ML, CL	A-4, A-6	0	100	100	90-100	75-95	<40	3-20
	4-14	Silt loam, loam, very fine sandy loam.	CL, CL-ML	A-4, A-6	0	100	100	90-100	75-95	<40	5-22
	14-70	Silty clay loam, loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	80-95	18-46	11-22
Gp:*											
Groom-----------	0-4	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0	100	100	90-100	75-95	<40	3-20
	4-14	Silt loam, loam, very fine sandy loam.	CL, CL-ML	A-4, A-6	0	100	100	90-100	75-95	<40	5-22
	14-75	Silty clay loam, loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	80-95	18-46	11-22
Mollicy----------	0-5	Loam-------------	ML, CL-ML, CL	A-4	0	100	100	80-100	60-90	17-30	NP-10
	5-34	Loam, silty clay clay loam, clay loam.	CL	A-6, A-4, A-7-6	0	100	100	90-100	70-90	22-48	8-30
	34-90	Sandy clay loam, loam, fine sandy loam.	CL, SC	A-6, A-4	0	100	100	70-90	35-75	22-48	8-30
Gs:*											
Groom-----------	0-4	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0	100	100	90-100	75-95	<40	3-20
	4-9	Silt loam, loam, very fine sandy loam.	CL, CL-ML	A-4, A-6	0	100	100	90-100	75-95	<40	5-22
	9-65	Silty clay loam, loam, silt loam.	CL	A-6, A-7	0	100	100	95-100	80-95	18-46	11-22
Mollicy----------	0-3	Loam-------------	ML, CL-ML, CL	A-4	0	100	100	80-100	60-90	17-30	NP-10
	3-34	Silt loam, silty clay loam, clay loam.	CL	A-6, A-4, A-7-6	0	100	100	90-100	70-90	22-48	8-30
	34-70	Sandy clay loam, loam, fine sandy loam.	CL, SC	A-6, A-4	0	100	100	70-90	35-75	22-48	8-30
Gu---------------- Guyton	0-23	Silt loam--------	ML, CL-ML	A-4	0	100	100	95-100	65-90	<27	NP-7
	23-42	Silt loam, silty clay loam, clay loam.	CL, CL-ML	A-6, A-4	0	100	100	94-100	75-95	22-40	6-18
	42-60	Silt loam, silty clay loam, clay loam.	CL, CL-ML, ML	A-6, A-4	0	100	100	95-100	51-95	<40	NP-18
Gy:*											
Guyton----------	0-21	Silt loam--------	ML, CL-ML	A-4	0	100	100	95-100	65-90	<27	NP-7
	21-42	Silt loam, silty clay loam, clay loam.	CL, CL-ML	A-6, A-4	0	100	100	94-100	75-95	22-40	6-18
	42-60	Silt loam, silty clay loam, clay loam.	CL, CL-ML, ML	A-6, A-4	0	100	100	95-100	51-95	<40	NP-18

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
Gy:* Cascilla----------	0-7	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	75-95	20-38	3-15
	7-60	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	100	100	95-100	75-100	20-39	5-15
Ha---------------- Haggerty	0-9	Loamy fine sand	SM, SM-SC, SC, CL-ML	A-4	0	100	95-100	70-85	35-60	<30	NP-10
	9-40	Fine sandy loam, loamy fine sand.	SM, SM-SC, SC, CL-ML	A-4	0	95-100	85-100	70-80	35-60	<30	NP-10
	40-60	Sand, fine sand, loamy fine sand.	SM, SP-SM	A-2, A-3	0	95-100	85-100	60-80	5-35	<20	NP
He---------------- Haggerty	0-7	Silty clay--------	CL, CH	A-6, A-7-6	0	100	100	100	95-100	30-75	11-50
	7-20	Fine sandy loam, loamy fine sand.	SM, SM-SC, SC, CL-ML	A-4	0	95-100	85-100	70-80	35-60	<30	NP-10
	20-60	Sand, fine sand, loamy fine sand.	SM, SP-SM	A-2, A-3	0	95-100	85-100	60-80	5-35	<20	NP
Hg---------------- Haggerty	0-10	Loamy fine sand	SM, SM-SC, SC, CL-ML	A-4	0	100	95-100	70-85	35-60	<30	NP-10
	10-46	Fine sandy loam, loamy fine sand.	SM, SM-SC, SC, CL-ML	A-4	0	95-100	85-100	70-80	35-60	<30	NP-10
	46-60	Sand, fine sand, loamy fine sand.	SM, SP-SM	A-2, A-3	0	95-100	85-100	60-80	5-35	<20	NP
Hh---------------- Haggerty	0-12	Silty clay--------	CL, CH	A-6, A-7-6	0	100	100	100	95-100	30-75	11-50
	12-60	Fine sandy loam, loamy fine sand.	SM, SM-SC, SC, CL-ML	A-4	0	95-100	85-100	70-80	35-60	<30	NP-10
Hr---------------- Hebert	0-15	Silt loam--------	ML, CL-ML	A-4	0	100	100	100	65-100	<27	NP-7
	15-44	Loam, silt loam, silty clay loam.	CL	A-6, A-7-6	0	100	100	100	85-100	31-45	11-22
	44-60	Stratified very fine sandy loam to silty clay loam.	ML, CL-ML, CL	A-4, A-6	0	100	100	90-100	60-100	22-40	3-18
Ht---------------- Hebert	0-6	Silty clay loam	CL	A-6	0	100	100	100	80-100	31-40	11-18
	6-60	Loam, silt loam, silty clay loam.	CL	A-6, A-7-6	0	100	100	100	85-100	31-45	11-22
HY:* Hebert-----------	0-15	Silt loam--------	ML, CL-ML	A-4	0	100	100	100	65-100	<27	NP-7
	15-45	Loam, silt loam, silty clay loam.	CL	A-6, A-7-6	0	100	100	100	85-100	31-45	11-22
	45-60	Stratified very fine sandy loam to silty clay loam.	ML, CL-ML, CL	A-4, A-6	0	100	100	90-100	60-100	22-40	3-18
Perry------------	0-6	Clay--------------	CH, CL	A-7-6	0	100	100	100	95-100	45-75	22-45
	6-45	Clay--------------	CH	A-7-6	0	100	100	100	95-100	60-80	33-50
	45-65	Clay--------------	CH, CL	A-7-6	0	90-100	85-100	75-100	70-100	45-80	22-50
Id:* Idee------------	0-5	Silt loam--------	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	80-95	17-40	4-22
	5-60	Silty clay loam, silt loam.	CL	A-4, A-6	0	100	100	90-100	80-95	28-40	8-22
	60-70	Loam, very fine sandy loam, silt loam.	CL, CL-ML, ML	A-4, A-6	0	100	100	85-100	60-90	17-40	4-22

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
Id:*											
Forestdale-------	0-7	Silty clay loam	CL, CH	A-6, A-7	0	100	100	95-100	90-100	30-58	12-30
	7-60	Silty clay, clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	90-100	40-65	20-40
	60-70	Silty clay loam, silt loam, very fine sandy loam.	CL, CL-ML	A-6, A-7, A-4	0	100	100	95-100	75-100	20-50	5-30
Ie:*											
Idee-------------	0-6	Silt loam---------	CL, CL-ML, ML	A-4, A-6	0	100	100	90-100	80-95	17-40	4-22
	6-44	Silty clay loam, silt loam.	CL	A-4, A-6	0	100	100	90-100	80-95	28-40	8-22
	44-70	Loam, very fine sandy loam, silt loam.	CL, CL-ML, ML	A-4, A-6	0	100	100	85-100	60-90	17-40	4-22
Goodwill---------	0-5	Silt loam---------	ML, CL-ML, CL	A-4, A-6	0	100	100	90-100	60-90	16-35	3-15
	5-28	Silty clay loam, loam, silt loam.	CL	A-6, A-7-6	0	100	100	95-100	85-95	25-45	11-22
	28-72	Loam, silt loam, fine sandy loam.	ML, CL-ML, CL	A-4, A-6	0	100	100	85-95	55-85	16-35	3-14
La---------------- Lafe	0-12	Silt loam---------	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	<30	NP-12
	12-36	Silt loam, silty clay loam.	CL	A-4, A-6, A-7	0	100	100	95-100	90-100	25-45	8-25
	36-70	Silt loam, silty clay loam, silty clay.	ML, CL, SM, CH	A-4, A-6, A-7	0	100	100	90-100	45-100	20-65	1-35
Lb---------------- Libuse	0-4	Silt loam---------	ML, CL-ML	A-4	0	100	100	85-100	65-90	<30	NP-7
	4-27	Silty clay loam, loam, silt loam.	CL	A-6	0	100	100	85-100	70-90	30-40	12-18
	27-60	Silt loam, loam, silty clay loam.	CL	A-6	0	100	100	85-100	60-90	30-40	12-18
	60-70	Very fine sandy loam, sandy clay loam, silt loam.	ML, SM, CL, SC	A-4, A-6	0	100	100	75-95	45-80	20-35	3-16
Le---------------- Libuse	0-8	Silt loam---------	ML, CL-ML	A-4	0	100	100	85-100	65-90	<30	NP-7
	8-22	Silty clay loam, loam, silt loam.	CL	A-6	0	100	100	85-100	70-90	30-40	12-18
	22-60	Silt loam, loam, silty clay loam.	CL	A-6	0	100	100	85-100	60-90	30-40	12-18
Lo---------------- Litro	0-4	Clay--------------	CL, CH	A-6, A-7-6	0	100	100	90-100	85-95	38-70	15-41
	4-70	Clay, silty clay, silty clay loam.	CH, CL	A-6, A-7-6	0	100	100	90-100	85-95	38-70	15-41
Lt---------------- Litro	0-4	Clay--------------	CL, CH	A-6, A-7-6	0	100	100	90-100	85-95	38-70	15-41
	4-60	Clay, silty clay, silty clay loam.	CH, CL	A-6, A-7-6	0	100	100	90-100	85-95	38-70	15-41
Me---------------- Mer Rouge	0-7	Silt loam---------	ML, CL-ML, CL	A-4	0	100	100	100	80-100	<30	NP-10
	7-26	Silty clay loam, silt loam, loam.	CL	A-6, A-7-6	0	70-90	70-90	70-90	50-85	31-45	11-22
	26-64	Silt loam, very fine sandy loam, loam.	CL-ML, CL, ML	A-4, A-6	0	70-90	70-90	70-90	50-85	<37	NP-15
Mo---------------- Mer Rouge	0-10	Silty clay loam	CL	A-6, A-7-6	0	100	100	100	90-100	32-45	11-22
	10-60	Silty clay loam, silt loam, loam.	CL	A-6, A-7-6	0	70-90	70-90	70-90	50-85	31-45	11-22

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Mr:*											
Mer Rouge	0-4	Silt loam	ML, CL-ML, CL	A-4	0	100	100	100	80-100	<30	NP-10
	4-60	Silty clay loam, silt loam, loam.	CL	A-6, A-7-6	0	70-90	70-90	70-90	50-85	31-45	11-22
Gallion	0-8	Silt loam	ML, CL-ML, CL	A-4, A-6	0	100	100	100	90-100	<28	NP-11
	8-47	Silt loam, silty clay loam, clay loam.	CL	A-6	0	100	100	100	90-100	28-40	11-17
	47-60	Stratified silty clay loam to very fine sandy loam.	CL, CL-ML	A-6, A-4	0	100	100	100	90-100	23-34	4-12
Pc Perry	0-6	Clay	CH, CL	A-7-6	0	100	100	100	95-100	45-75	22-45
	6-30	Clay	CH	A-7-6	0	100	100	100	95-100	60-80	33-50
	30-60	Clay	CH, CL	A-7-6	0	90-100	85-100	75-100	70-100	45-80	22-50
Pe Perry	0-5	Clay	CH, CL	A-7-6	0	100	100	100	95-100	45-75	22-45
	5-30	Clay	CH	A-7-6	0	100	100	100	95-100	60-80	33-50
	30-60	Clay	CH, CL	A-7-6	0	90-100	85-100	75-100	70-100	45-80	22-50
Pg Perry	0-4	Clay	CH, CL	A-7-6	0	100	100	100	95-100	45-75	22-45
	4-31	Clay	CH	A-7-6	0	100	100	100	95-100	60-80	33-50
	31-60	Clay	CH, CL	A-7-6	0	90-100	85-100	75-100	70-100	45-80	22-50
Pn Portland	0-4	Silt loam	ML, CL, CL-ML	A-4, A-6	0	100	100	95-100	95-100	20-35	2-15
	4-30	Clay, silty clay	CH	A-7	0	100	100	95-100	95-100	60-90	40-60
	30-46	Clay, silty clay	CH	A-7	0	100	98-100	95-100	95-100	60-90	40-60
	46-60	Stratified very fine sandy loam to clay.	CH, CL	A-7, A-6	0	100	98-100	95-100	85-100	35-90	20-55
Po Portland	0-6	Clay	CH	A-7	0	100	100	95-100	95-100	55-80	35-55
	6-55	Clay, silty clay	CH	A-7	0	100	100	95-100	95-100	60-90	40-60
	55-65	Clay, silty clay	CH	A-7	0	100	98-100	95-100	95-100	60-90	40-60
Pr Portland	0-11	Clay	CH	A-7	0	100	100	95-100	95-100	55-80	35-55
	11-44	Clay, silty clay	CH	A-7	0	100	100	95-100	95-100	60-90	40-60
	44-60	Stratified very fine sandy loam to clay.	CH, CL	A-7, A-6	0	100	98-100	95-100	85-100	35-90	20-55
Ra Rilla	0-10	Silt loam	ML, CL-ML, CL	A-4	0	100	100	100	90-100	<31	NP-10
	10-58	Silty clay loam, clay loam, silt loam.	CL	A-6, A-4	0	100	100	100	90-100	28-40	8-17
	58-71	Loam, silty clay loam, silty clay.	CL-ML, CL	A-4, A-6, A-7-6	0	100	100	100	75-100	23-45	4-21
Rb Rilla	0-4	Silt loam	ML, CL-ML, CL	A-4	0	100	100	100	90-100	<31	NP-10
	4-60	Silty clay loam, clay loam, silt loam.	CL	A-6, A-4	0	100	100	100	90-100	28-40	8-17
Rh:*											
Rilla	0-6	Silt loam	ML, CL-ML, CL	A-4	0	100	100	100	90-100	<31	NP-10
	6-60	Silty clay loam, clay loam, silt loam.	CL	A-6, A-4	0	100	100	100	90-100	28-40	8-17

See footnote at end of table.

TABLE 16.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
h:*											
Hebert----------	0-10	Silt loam--------	ML, CL-ML	A-4	0	100	100	100	65-100	<27	NP-7
	10-37	Loam, silt loam, silty clay loam.	CL	A-6, A-7-6	0	100	100	100	85-100	31-45	11-22
	37-60	Stratified very fine sandy loam to silty clay loam.	ML, CL-ML, CL	A-4, A-6	0	100	100	90-100	60-100	22-40	3-18
e---------------- Sterlington	0-8	Silt loam--------	ML	A-4	0	100	100	90-100	60-95	<23	NP-3
	8-57	Silt loam, very fine sandy loam, loam.	CL-ML, ML	A-4	0	100	100	90-100	80-95	<28	NP-7
	57-75	Very fine sandy loam, silt loam, loam.	ML, CL-ML	A-4	0	100	100	90-100	80-95	<28	NP-7
r---------------- Sterlington	0-8	Silt loam--------	ML	A-4	0	100	100	90-100	60-95	<23	NP-3
	8-60	Silt loam, very fine sandy loam, loam.	CL-ML, ML	A-4	0	100	100	90-100	80-95	<28	NP-7
t:*											
Sterlington-----	0-15	Silt loam--------	ML	A-4	0	100	100	90-100	60-95	<23	NP-3
	15-48	Silt loam, very fine sandy loam, loam.	CL-ML, ML	A-4	0	100	100	90-100	80-95	<28	NP-7
	48-60	Very fine sandy loam, silt loam, loam.	ML, CL-ML	A-4	0	100	100	90-100	80-95	<28	NP-7
Hebert----------	0-15	Silt loam--------	ML, CL-ML	A-4	0	100	100	100	65-100	<27	NP-7
	15-32	Loam, silt loam, silty clay loam.	CL	A-6, A-7-6	0	100	100	100	85-100	31-45	11-22
	32-60	Stratified very fine sandy loam to silty clay loam.	ML, CL-ML, CL	A-4, A-6	0	100	100	90-100	60-100	22-40	3-18
o---------------- Tillou	0-8	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	95-100	85-100	24-30	5-15
	8-40	Silty clay loam, silt loam.	CL	A-6, A-7-6	0	100	100	95-100	90-100	30-42	14-23
	40-76	Silty clay loam, silt loam.	CL	A-6, A-7-6	0	100	100	95-100	85-100	36-46	14-22
B:*											
Udalfs.											
Bussy-----------	0-4	Silt loam--------	ML, CL-ML, CL	A-4, A-6	0	100	100	95-100	90-100	<27	NP-12
	4-24	Silt loam, silty clay loam.	CL, CL-ML, ML	A-6, A-4	0	100	100	95-100	90-100	20-35	3-15
	24-60	Silt loam, silty clay loam.	CL, CL-ML, ML	A-6, A-4	0	100	100	95-100	85-95	25-40	3-25
r---------------- Wrightsville	0-11	Silt loam--------	ML, CL, CL-ML	A-4	0	100	95-100	90-100	75-100	<31	NP-10
	11-43	Silty clay, clay, silty clay loam.	CH, CL	A-7	0	100	100	95-100	90-100	41-65	22-40
	43-73	Silty clay loam, silty clay, silt loam.	CL, CH	A-7, A-6	0	100	95-100	95-100	90-100	35-55	16-30
o---------------- Yorktown	0-7	Clay-------------	MH, CH, OH	A-7	0	100	100	100	95-100	55-75	24-45
	7-48	Clay-------------	CH	A-7	0	100	100	100	95-100	60-80	32-50
	48-60	Clay-------------	CH	A-7	0	100	100	95-100	90-100	60-80	32-50

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Reaction	Shrink- swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	G/cm^3	In/hr	In/in	pH				Pct
Ad: Allemands	0-36	---	0.05-0.25	>2.0	0.20-0.50	3.6-5.5	Low	----	---	30-85
	36-65	45-95	0.25-1.00	<0.06	0.12-0.18	3.6-6.5	High	0.37		
Bs: Bussy	0-4	5-11	1.00-1.60	0.6-2.0	0.22-0.27	4.5-5.5	Low	0.49	3	.5-5
	4-35	15-30	1.30-1.60	0.6-2.0	0.17-0.27	4.5-5.5	Low	0.43		
	35-56	15-30	1.45-1.75	0.06-0.2	0.06-0.13	4.5-5.5	Moderate	0.37		
	56-65	15-30	1.30-1.60	0.2-0.6	0.17-0.22	4.5-6.0	Moderate	0.37		
Db: Debute	0-10	8-18	1.35-1.65	0.6-2.0	0.18-0.22	4.5-6.0	Low	0.49	3	.5-6
	10-32	18-35	1.35-1.65	0.6-2.0	0.18-0.25	4.5-6.0	Moderate	0.43		
	32-70	15-25	1.45-1.85	0.06-0.2	0.06-0.13	4.5-6.0	Moderate	0.32		
De: Debute	0-8	8-18	1.35-1.65	0.6-2.0	0.18-0.22	4.5-6.0	Low	0.49	3	.5-6
	8-27	18-35	1.35-1.65	0.6-2.0	0.18-0.25	4.5-6.0	Moderate	0.43		
	27-90	15-25	1.45-1.85	0.06-0.2	0.06-0.13	4.5-6.0	Moderate	0.32		
Dx: Dexter	0-7	10-27	1.30-1.70	0.6-2.0	0.15-0.24	5.1-6.5	Low	0.43	5	.5-4
	7-48	10-35	1.40-1.80	0.6-2.0	0.15-0.24	4.5-6.0	Low	0.32		
	48-87	10-30	1.30-1.70	0.6-6.0	0.08-0.18	4.5-6.0	Low	0.24		
Fo: Forestdale	0-6	27-38	1.35-1.65	0.2-0.6	0.20-0.22	4.5-6.0	Moderate	0.37	5	.5-4
	6-27	35-60	1.20-1.60	<0.06	0.14-0.18	4.5-6.0	High	0.28		
	27-60	10-35	1.35-1.65	0.2-0.6	0.17-0.22	5.1-7.8	Moderate	0.37		
Fr: Frizzell	0-48	8-18	1.35-1.65	0.6-2.0	0.15-0.22	4.5-5.5	Low	0.49	5	.5-4
	48-54	14-30	1.35-1.65	0.06-0.2	0.15-0.20	4.5-5.5	Low	0.43		
	54-76	14-30	1.35-1.65	0.06-0.6	0.15-0.20	4.5-5.5	Low	0.43		
Ga: Gallion	0-7	14-27	1.35-1.65	0.6-2.0	0.21-0.23	5.6-7.3	Low	0.43	5	.5-2
	7-19	14-35	1.35-1.75	0.6-2.0	0.20-0.22	5.6-7.8	Moderate	0.37		
	19-60	14-35	1.35-1.75	0.6-2.0	0.20-0.23	6.1-8.4	Low	0.37		
Gb: Gallion	0-14	27-35	1.35-1.65	0.6-2.0	0.20-0.22	5.6-7.3	Moderate	0.37	5	.5-2
	14-60	14-35	1.35-1.75	0.6-2.0	0.20-0.22	5.6-7.8	Moderate	0.32		
Gm: Groom	0-5	10-20	1.30-1.65	0.6-2.0	0.18-0.24	3.6-7.3	Low	0.43	5	.5-2
	5-12	18-25	1.35-1.80	0.2-0.6	0.18-0.24	3.6-5.5	Low	0.37		
	12-78	20-35	1.35-1.80	0.2-0.6	0.15-0.24	3.6-5.5	Moderate	0.37		
Go: Groom	0-4	10-20	1.30-1.65	0.6-2.0	0.18-0.24	3.6-5.5	Low	0.43	5	.5-2
	4-14	18-25	1.35-1.80	0.2-0.6	0.18-0.24	3.6-5.5	Low	0.37		
	14-70	20-35	1.35-1.80	0.2-0.6	0.15-0.24	3.6-5.5	Moderate	0.37		
Gp:*										
Groom	0-5	10-20	1.30-1.65	0.6-2.0	0.18-0.24	3.6-5.5	Low	0.43	5	.5-2
	4-14	18-25	1.35-1.80	0.2-0.6	0.18-0.24	3.6-5.5	Low	0.37		
	14-75	20-35	1.35-1.80	0.2-0.6	0.15-0.24	3.6-5.5	Moderate	0.37		
Mollicy	0-5	10-20	1.35-1.70	0.6-2.0	0.18-0.24	3.6-5.5	Low	0.43	3	.5-2
	5-34	18-35	1.35-1.80	0.2-0.6	0.15-0.22	3.6-5.5	Moderate	0.32		
	34-90	11-35	1.35-1.85	0.2-0.6	0.12-0.20	3.6-5.5	Moderate	0.28		
Gs:*										
Groom	0-4	10-20	1.30-1.65	0.6-2.0	0.18-0.24	3.6-5.5	Low	0.43	5	.5-2
	4-9	18-25	1.35-1.80	0.2-0.6	0.18-0.24	3.6-5.5	Low	0.37		
	9-65	20-35	1.35-1.80	0.2-0.6	0.15-0.24	3.6-5.5	Moderate	0.37		
Mollicy	0-3	10-20	1.35-1.70	0.6-2.0	0.18-0.24	3.6-5.5	Low	0.43	3	.5-2
	3-34	18-35	1.35-1.80	0.2-0.6	0.15-0.22	3.6-5.5	Moderate	0.32		
	34-70	12-35	1.35-1.85	0.2-0.6	0.12-0.20	3.6-5.5	Moderate	0.28		
Gu: Guyton	0-23	7-25	1.35-1.65	0.6-2.0	0.20-0.23	4.5-6.0	Low	0.43	5	<2
	23-42	20-35	1.35-1.70	0.06-0.2	0.15-0.22	3.6-6.0	Low	0.37		
	42-60	20-35	1.35-1.70	0.06-2.0	0.15-0.22	4.5-7.3	Low	0.37		

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Reaction	Shrink- swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	G/cm3	In/hr	In/in	pH				Pct
Gy:*										
Guyton----------	0-21	7-25	1.35-1.65	0.6-2.0	0.20-0.23	3.6-6.0	Low--------	0.43	5	<2
	21-42	20-35	1.35-1.70	0.06-0.2	0.15-0.22	3.6-6.0	Low--------	0.37		
	42-60	20-35	1.35-1.70	0.06-2.0	0.15-0.22	3.6-8.4	Low--------	0.37		
Cascilla--------	0-7	5-20	1.40-1.50	0.6-2.0	0.18-0.22	4.5-5.5	Low--------	0.43	5	1-3
	7-60	18-30	1.45-1.50	0.6-2.0	0.16-0.20	4.5-5.5	Low--------	0.43		
Ha---------------- Haggerty	0-9	5-12	1.35-1.70	0.6-6.0	0.11-0.24	3.6-5.5	Low--------	0.24	5	.1-1
	9-40	5-12	1.35-1.70	2.0-6.0	0.11-0.20	3.6-5.5	Low--------	0.24		
	40-60	2-8	1.45-1.85	6.0-20.0	0.02-0.11	3.6-5.5	Low--------	0.17		
He---------------- Haggerty	0-7	27-60	1.35-1.70	0.06-2.0	0.17-0.22	3.6-5.5	High-------	0.28	5	.5-4
	7-20	5-12	1.35-1.70	2.0-6.0	0.11-0.20	3.6-5.5	Low--------	0.24		
	20-60	2-8	1.45-1.85	6.0-20.0	0.02-0.11	3.6-5.5	Low--------	0.17		
Hg---------------- Haggerty	0-10	5-12	1.35-1.70	0.6-6.0	0.11-0.24	3.6-5.5	Low--------	0.24	5	.5-1
	10-46	5-12	1.35-1.70	2.0-6.0	0.11-0.20	3.6-5.5	Low--------	0.24		
	46-60	2-8	1.45-1.85	6.0-20.0	0.02-0.11	3.6-5.5	Low--------	0.17		
Hh---------------- Haggerty	0-12	27-60	1.35-1.70	0.06-2.0	0.17-0.22	3.6-5.5	High-------	0.28	5	.5-4
	12-60	5-12	1.35-1.70	2.0-6.0	0.11-0.20	3.6-5.5	Low--------	0.24		
Hr---------------- Hebert	0-15	10-27	1.30-1.65	0.6-2.0	0.21-0.23	4.5-7.3	Low--------	0.43	5	.5-4
	15-44	14-35	1.30-1.80	0.2-0.6	0.18-0.22	4.5-6.5	Moderate	0.32		
	44-60	10-35	1.30-1.80	0.6-2.0	0.18-0.22	5.1-7.8	Low--------	0.37		
Ht---------------- Hebert	0-6	27-35	1.40-1.80	0.2-0.6	0.20-0.22	5.1-7.3	Moderate	0.32	5	.5-4
	6-60	14-35	1.30-1.80	0.2-0.6	0.18-0.22	4.5-6.5	Moderate	0.32		
HY:*										
Hebert----------	0-15	10-27	1.30-1.65	0.6-2.0	0.21-0.23	4.5-7.3	Low--------	0.43	5	.5-4
	15-45	14-35	1.30-1.80	0.2-0.6	0.18-0.22	4.5-6.5	Moderate	0.32		
	45-60	10-35	1.30-1.80	0.6-2.0	0.18-0.22	5.1-7.8	Low--------	0.37		
Perry-----------	0-6	40-80	1.20-1.60	<0.06	0.17-0.20	4.5-6.0	High-------	0.32	5	.5-4
	6-45	55-85	1.17-1.50	<0.06	0.17-0.20	5.1-7.3	Very high	0.28		
	45-65	55-85	1.17-1.50	<0.06	0.17-0.20	6.1-8.4	Very high	0.28		
Id:*										
Idee------------	0-5	10-30	1.30-1.65	0.6-2.0	0.18-0.24	3.6-6.5	Low--------	0.37	5	.5-4
	5-60	18-34	1.35-1.65	0.6-2.0	0.15-0.24	4.5-6.5	Moderate	0.37		
	60-70	18-25	1.35-1.80	0.6-2.0	0.18-0.24	4.5-6.5	Low--------	0.32		
Forestdale------	0-7	27-38	1.50-1.55	0.2-0.6	0.20-0.22	4.5-6.0	Moderate	0.37	5	.5-4
	7-60	35-60	1.50-1.60	<0.06	0.14-0.18	4.5-6.0	High-------	0.28		
	60-70	10-35	1.45-1.55	0.2-0.6	0.17-0.22	5.1-7.8	Moderate	0.37		
Ie:*										
Idee------------	0-6	10-30	1.30-1.65	0.6-2.0	0.18-0.24	3.6-6.5	Low--------	0.37	5	.5-4
	6-44	18-34	1.35-1.65	0.6-2.0	0.15-0.24	3.6-6.5	Moderate	0.37		
	44-70	18-25	1.35-1.80	0.6-2.0	0.18-0.24	4.5-6.5	Low--------	0.32		
Goodwill--------	0-5	5-18	1.35-1.65	0.6-2.0	0.18-0.24	4.5-6.0	Low--------	0.37	5	.5-3
	5-28	20-35	1.35-1.70	0.6-2.0	0.18-0.24	4.5-6.0	Moderate	0.37		
	28-72	10-25	1.35-1.75	0.6-2.0	0.18-0.24	4.5-6.5	Low--------	0.37		
La---------------- Lafe	0-12	10-25	1.30-1.50	0.6-2.0	0.13-0.24	5.1-6.5	Low--------	0.49	1	1-4
	12-36	18-35	1.40-1.75	<0.06	0.09-0.15	7.4-9.0	Moderate	0.49		
	36-70	12-40	1.40-1.75	<0.2	0.02-0.07	7.4-9.0	Moderate	0.49		
Lb---------------- Libuse	0-4	16-35	1.35-1.65	0.6-2.0	0.18-0.22	5.1-6.5	Low--------	0.49	3	.5-4
	4-27	16-35	1.35-1.70	0.2-0.6	0.18-0.22	4.5-6.0	Low--------	0.37		
	27-60	18-35	1.45-1.80	0.06-0.2	0.10-0.14	4.5-6.0	Low--------	0.37		
	60-70	8-32	1.35-1.75	0.2-2.0	0.14-0.18	4.5-6.0	Low--------	0.43		
Le---------------- Libuse	0-8	5-15	1.35-1.65	0.6-2.0	0.18-0.22	5.1-6.5	Low--------	0.49	3	.5-4
	8-22	18-32	1.35-1.70	0.2-0.6	0.18-0.22	4.5-6.0	Low--------	0.37		
	22-60	18-35	1.45-1.80	0.06-0.2	0.10-0.14	4.5-5.5	Low--------	0.37		

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	G/cm3	In/hr	In/in	pH				Pct
Lo------ Litro	0-4	30-50	1.20-1.60	<0.06	0.12-0.20	3.6-5.5	High------	0.32	3	.5-5
	4-70	35-50	1.20-1.60	<0.06	0.12-0.20	3.6-5.5	High------	0.32		
Lt------ Litro	0-4	30-50	1.20-1.60	<0.06	0.12-0.20	3.6-5.5	High------	0.32	3	.5-5
	4-60	35-50	1.20-1.60	<0.06	0.12-0.20	3.6-5.5	High------	0.32		
Me------ Mer Rouge	0-7	10-26	1.30-1.65	0.6-2.0	0.21-0.23	6.1-7.3	Low-------	0.43	5	1-4
	7-26	14-35	1.35-1.70	0.2-0.6	0.20-0.22	6.1-8.4	Moderate	0.32		
	26-64	10-27	1.35-1.65	0.2-2.0	0.20-0.23	6.6-8.4	Low-------	0.32		
Mo------ Mer Rouge	0-10	27-38	1.30-1.65	0.2-0.6	0.20-0.22	6.1-7.3	Moderate	0.37	5	1-4
	10-60	14-35	1.35-1.70	0.2-0.6	0.20-0.22	6.1-8.4	Moderate	0.32		
Mr:*										
Mer Rouge-------	0-4	10-26	1.30-1.65	0.6-2.0	0.21-0.23	6.1-7.3	Low-------	0.43	5	1-4
	4-60	14-35	1.35-1.70	0.2-0.6	0.20-0.22	6.1-8.4	Moderate	0.32		
Gallion---------	0-8	14-27	1.35-1.65	0.6-2.0	0.21-0.23	5.6-7.3	Low-------	0.43	5	.5-2
	8-47	14-35	1.35-1.75	0.6-2.0	0.20-0.22	5.6-7.8	Moderate	0.32		
	47-60	14-35	1.35-1.75	0.6-2.0	0.20-0.23	6.1-8.4	Low-------	0.37		
Pc------ Perry	0-6	40-80	1.20-1.60	<0.06	0.17-0.20	4.5-6.0	High------	0.32	5	.5-4
	6-30	60-85	1.17-1.50	<0.06	0.17-0.20	5.1-7.3	Very high	0.28		
	30-60	60-85	1.17-1.50	<0.06	0.17-0.20	6.1-8.4	Very high	0.28		
Pe------ Perry	0-5	40-80	1.20-1.60	<0.06	0.17-0.20	4.5-6.0	High------	0.32	5	.5-4
	5-30	60-85	1.17-1.50	<0.06	0.17-0.20	5.1-7.3	Very high	0.28		
	30-60	60-85	1.17-1.50	<0.06	0.17-0.20	6.1-8.4	Very high	0.28		
Pg------ Perry	0-4	40-80	1.20-1.60	<0.06	0.17-0.20	4.5-6.0	High------	0.32	5	.5-4
	4-31	60-85	1.17-1.50	<0.06	0.17-0.20	5.1-7.3	Very high	0.28		
	31-60	60-85	1.17-1.50	<0.06	0.17-0.20	6.1-8.4	Very high	0.28		
Pn------ Portland	0-4	15-25	1.25-1.55	0.2-2.0	0.16-0.24	4.5-5.5	Low-------	0.43	5	1-4
	4-30	60-85	1.15-1.45	<0.06	0.12-0.18	4.5-6.0	High------	0.32		
	30-46	60-85	1.15-1.45	<0.06	0.12-0.18	6.1-8.4	High------	0.32		
	46-60	15-60	1.15-1.55	<0.06	0.12-0.22	6.1-8.4	High------	0.32		
Po------ Portland	0-6	40-60	1.15-1.50	<0.06	0.12-0.18	4.5-6.0	High------	0.32	5	1-4
	6-55	60-85	1.15-1.45	<0.06	0.12-0.18	4.5-8.4	High------	0.32		
	55-65	60-85	1.15-1.45	<0.06	0.12-0.18	6.1-8.4	High------	0.32		
Pr------ Portland	0-11	40-60	1.15-1.50	<0.06	0.12-0.18	4.5-6.0	High------	0.32	5	1-4
	11-44	60-85	1.15-1.45	<0.06	0.12-0.18	4.5-7.3	High------	0.32		
	44-60	15-60	1.15-1.55	<0.06	0.12-0.22	6.1-8.4	High------	0.32		
Ra------ Rilla	0-10	14-27	1.30-1.80	0.6-2.0	0.21-0.23	4.5-7.3	Low-------	0.43	5	.5-4
	10-58	18-35	1.30-1.80	0.6-2.0	0.20-0.22	3.6-5.5	Moderate	0.32		
	58-71	20-50	1.20-1.80	0.6-2.0	0.18-0.22	4.5-7.3	Low-------	0.32		
Rb------ Rilla	0-4	14-27	1.30-1.80	0.6-2.0	0.21-0.23	4.5-7.3	Low-------	0.43	5	.5-4
	4-60	18-35	1.30-1.80	0.6-2.0	0.20-0.22	3.6-7.3	Moderate	0.32		
Rh:*										
Rilla-----------	0-6	14-27	1.30-1.80	0.6-2.0	0.21-0.23	4.5-7.3	Low-------	0.43	5	.5-4
	6-60	18-35	1.30-1.80	0.6-2.0	0.20-0.22	3.6-7.3	Moderate	0.32		
Hebert----------	0-10	10-27	1.30-1.65	0.6-2.0	0.21-0.23	5.1-7.3	Low-------	0.43	5	.5-4
	10-37	14-35	1.30-1.80	0.2-0.6	0.18-0.22	4.5-6.5	Moderate	0.32		
	37-60	10-35	1.30-1.80	0.6-2.0	0.18-0.22	5.1-7.8	Low-------	0.37		
Se------ Sterlington	0-8	10-18	1.30-1.65	0.6-2.0	0.18-0.22	4.5-6.0	Low-------	0.43	5	.5-4
	8-57	10-18	1.30-1.70	0.6-2.0	0.18-0.22	4.5-6.5	Low-------	0.37		
	57-75	10-22	1.30-1.70	0.6-2.0	0.18-0.22	4.5-7.8	Low-------	0.37		
Sr------ Sterlington	0-8	10-18	1.30-1.65	0.6-2.0	0.18-0.22	4.5-6.0	Low-------	0.43	5	.5-4
	8-60	10-18	1.30-1.70	0.6-2.0	0.18-0.22	4.5-7.8	Low-------	0.37		

See footnote at end of table.

TABLE 17.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Shrink- swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	G/cm3	In/hr	In/in	pH				Pct
St:*										
Sterlington-----	0-15	10-18	1.30-1.65	0.6-2.0	0.18-0.22	4.5-6.0	Low--------	0.43	5	.5-4
	15-48	10-18	1.30-1.70	0.6-2.0	0.18-0.22	4.5-6.5	Low--------	0.37		
	48-60	10-22	1.30-1.70	0.6-2.0	0.18-0.22	4.5-7.8	Low--------	0.37		
Hebert-----------	0-15	10-27	1.30-1.65	0.6-2.0	0.21-0.23	5.1-7.3	Low--------	0.43	5	.5-4
	15-32	14-35	1.30-1.80	0.2-0.6	0.18-0.22	4.5-6.5	Moderate	0.32		
	32-60	10-35	1.30-1.80	0.6-2.0	0.18-0.22	5.1-7.8	Low--------	0.37		
To---------------- Tillou	0-8	10-20	1.10-1.65	0.6-2.0	0.24-0.27	4.5-6.0	Low--------	0.43	5	.5-4
	8-40	20-35	1.30-1.65	0.6-2.0	0.14-0.23	4.5-6.0	Moderate	0.43		
	40-76	20-35	1.30-1.65	0.06-0.2	0.14-0.20	5.1-7.8	Moderate	0.37		
UB:*										
Udalfs.										
Bussy------------	0-4	5-11	1.00-1.60	0.6-2.0	0.22-0.27	4.5-5.5	Low--------	0.49	3	.5-5
	4-24	15-30	1.30-1.60	0.6-2.0	0.17-0.27	4.5-5.5	Low--------	0.43		
	24-60	15-30	1.45-1.75	0.06-0.2	0.06-0.13	4.5-6.0	Moderate	0.37		
Wr---------------- Wrightsville	0-11	10-25	1.25-1.50	0.2-0.6	0.16-0.24	3.6-5.5	Low--------	0.49	5	.5-4
	11-43	35-55	1.20-1.45	<0.06	0.14-0.22	3.6-5.5	High-------	0.37		
	43-73	20-45	1.20-1.50	<0.06	0.14-0.22	5.1-8.4	High-------	0.43		
Yo---------------- Yorktown	0-7	40-65	1.15-1.45	<0.06	0.12-0.18	4.5-6.0	High-------	0.32	5	---
	7-48	60-80	1.15-1.45	<0.06	0.12-0.18	4.5-6.0	Very high	0.32		
	48-60	60-80	1.15-1.45	<0.06	0.12-0.18	4.5-6.5	Very high	0.32		

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--SOIL AND WATER FEATURES

[See text for definition of terms. The symbol > means more than. Absence of an entry indicates that the feature is not concern or that data were not estimated]

Map symbol and soil name	Hydro- logic group	Flooding			High water table			Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Uncoated steel	Concrete
					Ft				
Ad: Allemands	D	Rare	---	---	+1-4.0	Apparent	Jan-Dec	High	Moderate.
Bs: Bussy	C	None	---	---	2.0-3.0	Perched	Dec-Mar	Moderate	Moderate.
Db, De: Debute	C	None	---	---	1.5-3.0	Perched	Dec-Mar	Moderate	Moderate.
Dx: Dexter	B	None	---	---	>6.0	---	---	Moderate	Moderate.
Fo: Forestdale	D	Rare	---	---	0.5-2.0	Apparent	Jan-Apr	High	Moderate.
Fr: Frizzell	C	None	---	---	1.5-4.0	Apparent	Dec-Apr	High	High.
Ga, Gb: Gallion	B	None	---	---	>6.0	---	---	Moderate	Low.
Gm: Groom	C	Rare	---	---	0-1.0	Apparent	Nov-Jul	High	Moderate.
Go: Groom	C	Occasional	Long	Nov-Jul	0-1.0	Apparent	Nov-Jul	High	Moderate.
Gp:*									
Groom	C	Rare	---	---	0-1.0	Apparent	Nov-Jul	High	Moderate.
Mollicy	C	Rare	---	---	1.5-3.0	Apparent	Nov-Jun	High	High.
Gs:*									
Groom	C	Occasional	Long	Nov-Jul	0-1.0	Apparent	Nov-Jul	High	Moderate.
Mollicy	C	Occasional	Brief to long.	Nov-Jun	1.5-3.0	Apparent	Nov-Jun	High	High.
Gu: Guyton	D	None	---	---	0-1.5	Perched	Dec-May	High	Moderate.
Gy:*									
Guyton	D	Frequent	Very brief to long.	Jan-Dec	0-1.5	Perched	Dec-May	High	Moderate.
Cascilla	B	Frequent	Very brief to long.	Jan-Apr	>6.0	---	---	Low	Moderate.
Ha, He: Haggerty	B	Rare	---	---	0-1.5	Apparent	Nov-Jun	High	High.
Hg, Hh: Haggerty	B	Frequent	Very long	Nov-Jul	0-1.5	Apparent	Nov-Jun	High	High.
Hr, Ht: Hebert	C	None	---	---	1.5-3.0	Apparent	Dec-Apr	High	Moderate.
HY:*									
Hebert	C	Frequent	Brief to very long.	Dec-Jun	1.5-3.0	Apparent	Dec-Apr	High	Moderate.
Perry	D	Frequent	Brief to very long.	Dec-Jun	0-2.0	Apparent	Dec-Apr	High	Moderate.

See footnote at end of table.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydro-logic group	Flooding			High water table			Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Uncoated steel	Concrete
					Ft				
Id:*									
Idee	C	None	---	---	1.5-3.5	Apparent	Jan-Apr	High	Moderate.
Forestdale	D	Rare	---	---	0.5-2.0	Apparent	Jan-Apr	High	Moderate.
Ie:*									
Idee	C	None	---	---	1.5-3.5	Apparent	Jan-Apr	High	Moderate.
Goodwill	B	None	---	---	>6.0	---	---	Moderate	Moderate.
La Lafe	D	None	---	---	0-1.0	Perched	Dec-Apr	High	Moderate.
Lb, Le Libuse	C	None	---	---	1.5-3.0	Perched	Dec-Apr	High	Moderate.
Lo Litro	D	Rare	---	---	0-1.0	Apparent	Nov-Jun	High	High.
Lt Litro	D	Frequent	Brief to very long.	Nov-Jul	0-1.0	Apparent	Nov-Jun	High	High.
Me, Mo Mer Rouge	B	None	---	---	3.0-5.0	Apparent	Dec-Apr	High	Low.
Mr:*									
Mer Rouge	B	None	---	---	3.0-5.0	Apparent	Dec-Apr	High	Low.
Gallion	B	None	---	---	>6.0	---	---	Moderate	Low.
Pc, Pe Perry	D	Rare	---	---	0-2.0	Apparent	Dec-Apr	High	Moderate.
Pg Perry	D	Occasional	Brief to very long.	Dec-Jun	0-2.0	Apparent	Dec-Apr	High	Moderate.
Pn, Po Portland	D	Rare	---	---	0-1.0	Perched	Dec-May	High	Moderate.
Pr Portland	D	Occasional	Brief to very long.	Dec-May	0-1.0	Perched	Dec-May	High	Moderate.
Ra, Rb Rilla	B	None	---	---	4.0-6.0	Apparent	Dec-Apr	Moderate	High.
Rh:*									
Rilla	B	None	---	---	4.0-6.0	Apparent	Dec-Apr	Moderate	High.
Hebert	C	None	---	---	1.5-3.0	Apparent	Dec-Apr	High	Moderate.
Se, Sr Sterlington	B	None	---	---	>6.0	---	---	Low	Moderate.
St:*									
Sterlington	B	None	---	---	>6.0	---	---	Low	Moderate.
Hebert	C	None	---	---	1.5-3.0	Apparent	Dec-Apr	High	Moderate.
To Tillou	C	None	---	---	0.5-2.5	Perched	Dec-Apr	High	Moderate.
UB:*									
Udalfs.									
Bussy	C	None	---	---	2.0-3.0	Perched	Dec-Mar	Moderate	Moderate.

See footnote at end of table.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydro-logic group	Flooding			High water table			Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Uncoated steel	Concrete
					Ft				
Wr: Wrightsville	D	Rare	---	---	0.5-1.5	Perched	Dec-Apr	High	High.
Yo: Yorktown	D	Frequent	Very long	Oct-Aug	+5-0.5	Apparent	Oct-Aug	High	Moderate.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 19.--FERTILITY TEST DATA ON SELECTED SOILS

[Analyses by the Soil Fertility Laboratory, Louisiana Agricultural Experiment Station. The symbol TR means trace. The symbol < means less than]

Soil and sample number	Depth from surface	Horizon	pH 1:1 H_2O	Organic matter content	Extractable P	Extractable cations: Ca	Mg	K	Na	Al	H	Extractable acidity	Cation-exchange capacity (sum)	Base saturation (sum)	Al* saturation	Na** saturation
	In			Pct	Ppm	Meq/100g								Pct	Pct	Pct
Allemands muck: (S80LA-67-13)	0-6	Oa1	5.4	63.3	332	22.0	5.7	0.4	0.3	0.2	0.4	46.6	75.0	38	<1.0	<1.0
	6-18	Oa2	4.3	84.6	32	14.4	4.7	0.1	0.4	0.9	1.4	56.0	75.6	26	4.1	<1.0
	18-30	Oa3	4.2	77.4	22	11.2	4.7	0.1	0.4	1.3	1.2	47.2	63.6	26	6.9	<1.0
	30-36	Oa4	4.4	78.9	28	12.4	5.1	0.2	0.3	1.0	1.3	45.5	63.5	28	4.7	<1.0
	36-65	IICg	4.4	14.5	66	13.4	10.0	1.0	0.3	5.4	1.7	25.0	49.7	50	17.0	<1.0
Cascilla silt loam: (S80LA-67-5)	0-7	Ap	4.7	2.60	14	0.7	0.3	0.2	2.4	1.8	0.4	10.1	13.7	26	31.0	17.5
	7-13	B1	4.7	0.53	15	0.4	0.3	0.1	0.1	2.6	0.4	7.6	8.5	11	66.7	1.2
	13-24	B21	4.8	0.10	27	0.4	0.9	0.2	0.1	3.6	0.6	8.6	10.2	16	62.1	1.2
	24-40	B22	4.7	0.19	22	0.4	0.8	0.1	0.1	3.3	0.7	6.1	7.5	19	61.1	1.3
	40-60	B3	4.7	0.29	22	0.4	0.7	0.1	0.1	3.6	0.7	8.1	9.4	14	64.3	1.1
Dexter silt loam: (S80LA-67-6)	0-2	Ap1	5.5	1.97	76	4.1	1.0	0.4	0.1	0.2	0.1	4.1	9.7	58	3.4	1.0
	2-7	Ap2	5.6	1.44	76	4.3	1.0	0.3	0.1	0.2	0.1	5.6	11.3	50	3.3	0.9
	7-14	B21t	5.7	0.43	115	6.7	1.8	0.2	0.1	0.2	0.2	5.6	14.4	61	2.2	0.7
	14-28	B22t	5.2	0.29	69	5.3	1.9	0.2	0.1	1.3	0.2	6.1	13.6	55	14.4	0.7
	28-48	B23t	5.5	0.10	48	3.7	1.2	0.1	0.1	0.4	0.2	3.0	8.1	63	7.0	1.2
	48-59	IIB3	5.8	0.15	57	2.3	0.6	0.1	0.1	0.2	0.0	2.0	5.1	61	6.1	2.0
	59-87	IIC	5.8	0.15	57	2.4	0.7	0.1	0.1	0.2	0.0	1.0	4.3	77	5.7	2.3
Forestdale silty clay loam: (S80LA-67-7)	0-6	Ap	5.9	1.73	58	13.5	5.5	0.4	0.3	0.0	0.2	8.1	27.8	71	0.0	1.1
	6-27	B2tg	5.1	0.82	28	13.4	7.8	0.4	1.1	1.6	0.2	10.1	32.8	69	6.5	3.4
	27-35	B31g	5.9	0.24	9	9.4	8.0	0.3	2.2	0.6	0.3	8.6	28.5	70	2.9	7.7
	35-60	B32g	6.4	0.10	21	8.5	9.9	0.3	3.4	0.0	0.0	4.1	26.2	84	0.0	13.0
Frizzell silt loam: (S80LA-67-15)	0-4	A1	5.2	2.31	8	2.1	0.6	0.1	0.1	0.2	0.4	5.6	8.5	34	5.7	1.2
	4-25	B&A21	4.9	0.43	5	0.9	0.6	0.1	0.1	2.2	0.2	4.1	5.8	29	53.6	1.7
	25-48	B&A22	5.2	0.29	5	0.5	0.6	0.1	0.2	3.4	0.3	6.6	8.0	18	66.7	2.5
	48-54	B21t	5.3	0.29	5	1.4	1.7	0.1	0.8	4.9	0.1	9.1	13.1	30	54.4	6.9
	54-76	B22t	5.3	0.19	5	1.7	1.6	0.1	0.6	2.5	0.4	4.1	8.1	49	36.2	7.4
Gallion silt loam: (S80LA-67-16)	0-7	Ap	5.8	1.20	13	5.4	2.0	0.1	0.1	0.0	0.2	3.6	11.2	68	0.0	0.9
	7-19	B21t	6.3	0.34	5	9.9	6.0	0.2	0.1	0.0	0.0	4.1	20.3	80	0.0	0.5
	19-27	B22t	8.1	0.29	40	24.4	4.7	0.2	0.1	0.0	0.0	0.0	29.4	100	0.0	0.3
	27-38	B3	8.2	0.24	131	8.7	2.9	0.1	0.1	0.0	0.0	0.0	11.8	100	0.0	0.8
	38-60	C	8.3	0.19	75	24.0	3.2	0.1	0.1	0.0	0.0	0.0	27.4	100	0.0	0.4
Guyton silt loam: (S80LA-67-9)	0-6	A1	4.9	1.30	5	1.0	0.4	0.1	0.1	1.4	0.4	4.2	5.8	28	41.2	1.7
	6-13	A21g	4.9	1.39	5	0.6	0.3	0.1	0.1	1.8	0.4	3.2	4.3	26	54.5	2.3
	13-23	A22g	5.0	0.29	5	0.4	0.3	0.1	0.1	2.3	0.6	3.1	4.0	22	60.5	2.5
	23-32	B&A	5.3	0.29	5	0.5	0.6	0.1	0.3	3.5	1.1	5.8	7.3	20	57.4	4.1
	32-42	B22tg	5.2	0.19	5	0.4	0.9	0.1	0.8	4.9	0.8	8.9	11.1	20	62.0	7.2
	42-60	B3tg	5.1	0.15	7	0.7	1.1	0.1	1.4	4.6	0.9	7.3	10.6	31	57.3	13.2

TABLE 19.--FERTILITY TEST DATA ON SELECTED SOILS--Continued

Soil and sample number	Depth from surface	Horizon	pH 1:1 H_2O	Organic matter content	Extractable P	Extractable cations: Ca	Mg	K	Na	Al	H	Extractable acidity	Cation-exchange capacity (sum)	Base saturation (sum)	Al* saturation	Na** saturation
	In			Pct	Ppm	Meq/100g								Pct	Pct	Pct
Haggerty loamy fine sand: (S80LA-67-11)	0-9	A1	4.8	0.15	5	0.6	0.1	TR	TR	0.5	0.2	1.0	1.7	41	35.7	TR
	9-14	B21t	4.5	0.39	5	1.0	0.2	0.1	0.1	3.9	0.5	6.0	7.4	19	67.2	1.4
	14-20	B22t	4.4	0.29	5	0.6	0.1	0.1	0.1	4.1	0.8	5.0	5.9	15	70.7	1.7
	20-30	B31	4.4	0.29	6	0.4	0.1	0.1	0.1	3.2	0.4	4.0	4.7	15	74.4	2.1
	30-40	B32	4.4	0.10	5	0.2	TR	TR	TR	1.8	0.2	2.0	2.2	9	82.0	TR
	40-60	C	4.6	0.10	5	0.3	TR	TR	TR	1.2	0.3	1.7	2.0	18	66.7	TR
Hebert silt loam: (S80LA-67-17)	0-6	Ap	6.7	1.15	137	5.5	0.9	0.3	0.1	0.0	0.0	2.0	8.8	77	0.0	1.1
	6-15	A2	4.5	0.34	48	2.2	0.9	0.1	0.1	1.6	0.4	5.6	8.9	37	30.2	1.1
	15-22	B21t	4.6	0.19	56	2.8	2.4	0.1	0.2	2.4	0.6	5.6	11.1	50	28.2	1.8
	22-34	B22t	4.8	0.15	61	3.3	4.1	0.2	0.4	2.8	0.0	7.1	15.1	53	26.7	2.6
	34-44	B3	5.3	0.15	116	5.6	6.4	0.3	0.7	0.8	0.6	6.6	19.6	66	5.6	3.6
	44-60	C	5.9	0.24	111	9.2	8.8	0.4	1.2	0.2	0.2	6.1	25.7	76	1.0	4.7
Lafe silt loam: (S80LA-67-14)	0-4	A1	6.0	2.88	4	3.0	1.6	0.1	0.2	0.0	0.2	4.6	9.5	52	0.0	2.1
	4-12	A2	7.4	0.30	0	1.6	1.6	0.0	1.4	0.0	0.0	0.0	4.6	100	0.0	30.4
	12-25	B21t	8.6	0.20	2	2.8	4.5	0.1	4.9	0.0	0.0	0.0	12.3	100	0.0	39.8
	25-36	B22t	8.5	0.28	0	8.8	5.9	0.1	5.0	0.0	0.0	0.0	19.8	100	0.0	25.2
	36-50	B23t	8.7	0.25	0	10.2	7.2	0.1	4.1	0.0	0.0	0.0	21.6	100	0.0	19.0
	50-70	C	8.5	0.15	0	1.4	2.0	0.0	3.2	0.0	0.0	0.0	6.6	100	0.0	48.5
Litro clay: (S80LA-67-10)	0-4	A1	4.7	4.52	37	9.9	3.4	0.4	0.4	3.0	0.9	17.2	31.3	45	16.7	1.3
	4-14	B21g	4.6	2.12	26	5.1	2.4	0.2	0.4	9.4	1.7	21.4	29.5	28	49.0	1.4
	14-40	B22g	4.5	1.20	16	4.6	2.8	0.3	0.6	12.4	2.4	23.6	31.9	26	53.7	1.9
	40-70	B23g	4.4	0.82	10	4.1	3.1	0.3	0.6	11.3	1.7	20.4	28.5	28	53.6	2.1
Mer Rouge silt loam: (S80LA-67-12)	0-7	Ap	7.3	0.99	126	11.4	3.3	0.2	0.1	0.0	0.0	0.0	15.0	100	0.0	TR
	7-18	B21t	7.4	0.74	64	18.0	5.0	0.2	0.5	0.0	0.0	0.6	24.3	98	0.0	2.0
	18-26	B22t	7.7	0.50	106	18.6	4.9	0.2	0.4	0.0	0.2	0.6	24.7	98	0.0	1.6
	26-32	B23t	7.6	0.66	50	32.2	4.7	0.2	0.3	0.0	0.0	0.0	37.4	100	0.0	TR
	32-50	B31t	8.0	0.25	144	18.2	2.8	0.1	0.2	0.0	0.0	0.0	21.3	100	0.0	TR
	50-64	B32	7.7	0.25	186	7.8	2.0	0.1	0.1	0.0	0.0	0.0	10.0	100	0.0	1.0
Perry clay: (S80LA-67-18)	0-6	Ap	5.9	3.13	51	27.8	11.4	0.9	0.3	0.0	0.2	11.6	52.0	78	0.0	0.6
	6-19	B21g	5.4	0.96	10	28.4	12.7	0.6	0.9	0.2	0.4	12.6	55.2	77	0.5	1.3
	19-30	B22g	6.0	0.53	7	26.9	15.4	0.4	2.4	0.0	0.0	9.6	54.7	82	0.0	4.4
	30-44	IIB3	7.6	0.39	141	39.3	17.8	0.6	4.1	0.0	0.0	3.0	64.8	95	0.0	6.3
	44-60	IIC	7.7	0.39	98	37.0	18.2	0.7	4.6	0.0	0.0	1.0	61.5	98	0.0	7.5
Portland clay: (S80LA-67-19)	0-6	A1	5.9	2.60	76	16.3	9.8	0.8	0.5	4.2	0.4	22.2	49.6	55	13.1	1.0
	6-16	B21	5.4	0.77	63	21.6	17.6	1.0	1.4	1.4	0.6	18.2	59.8	70	3.2	2.3
	16-27	B22	7.2	0.67	121	38.4	17.6	0.8	2.8	0.0	0.0	6.6	66.2	90	0.0	4.2
	27-55	B23	7.9	0.53	134	38.6	16.5	0.8	4.0	0.0	0.0	1.5	61.4	98	0.0	6.5
	55-65	B24	7.9	0.48	116	37.9	15.1	0.8	5.7	0.0	0.0	1.5	61.0	98	0.0	9.3

TABLE 19.--FERTILITY TEST DATA ON SELECTED SOILS--Continued

Soil and sample number	Depth from surface	Horizon	pH 1:1 H_2O	Organic matter content	Extract-able P	Extractable cations: Ca	Mg	K	Na	Al	H	Extract-able acidity	Cation-exchange capacity (sum)	Base satura-tion (sum)	Al* satu-ration	Na** satu-ration
	In			Pct	Ppm	Meq/100g								Pct	Pct	Pct
Rilla silt loam: (S80LA-67-20)	0-6	Ap	5.2	0.43	146	6.0	2.4	0.3	0.2	0.8	0.4	6.1	15.0	59	7.9	1.3
	6-10	A2	4.8	0.24	154	5.0	1.0	0.1	0.1	2.5	0.3	7.1	13.3	47	27.8	0.8
	10-15	B21t	4.7	0.24	182	7.2	4.0	0.4	0.4	4.2	0.2	11.1	23.1	52	25.6	1.7
	15-28	B22t	5.0	0.15	112	8.6	4.7	0.3	0.7	1.4	0.4	7.1	21.4	67	8.7	3.3
	28-41	B23t	5.1	0.19	129	10.8	6.2	0.4	1.1	0.7	0.4	7.1	25.6	72	3.6	4.3
	41-58	IIB3	5.4	0.10	141	5.7	3.0	0.2	0.7	0.2	0.2	2.0	11.1	82	2.1	6.3
	58-71	IIC	7.1	0.24	226	20.6	10.8	0.8	3.4	0.0	0.0	4.1	39.7	90	0.0	8.6
Sterlington silt loam: (S80LA-67-21)	0-8	Ap	5.7	0.82	110	3.3	0.6	0.2	0.1	0.1	0.1	2.0	6.2	68	2.3	1.6
	8-22	B2t	4.8	0.24	131	4.0	2.9	0.2	0.2	4.0	0.0	7.6	14.9	50	35.4	1.3
	22-28	A'&B	4.9	0.19	140	1.8	1.8	0.1	0.1	1.9	0.0	3.0	6.8	56	33.3	1.5
	28-57	B'2t	5.0	0.00	163	2.4	3.2	0.2	0.1	2.4	0.0	5.1	11.0	54	28.9	0.9
	57-75	C	5.4	0.19	142	2.4	2.6	0.1	0.2	0.2	0.6	1.0	6.3	84	3.3	3.2
Wrightsville silt loam: (S80LA-67-22)	0-2	A1	4.5	2.69	8	1.2	0.6	0.1	0.2	2.9	0.9	10.1	12.3	17	49.2	1.6
	2-11	A2g	4.8	0.29	5	2.0	0.9	0.1	0.3	5.8	0.8	11.1	14.4	23	58.6	2.1
	11-19	Bg&Ag	4.8	0.19	5	2.8	1.5	0.1	0.7	6.4	0.5	11.1	16.6	31	53.3	4.2
	19-28	B2tg	4.5	0.29	5	5.9	3.8	0.2	2.6	7.2	0.2	15.7	28.2	44	36.2	9.2
	28-43	B3tg	4.6	0.15	5	6.8	4.6	0.2	4.8	4.1	0.0	10.1	26.5	62	20.0	18.1
	43-73	C	6.3	0.15	5	9.9	6.1	0.2	7.2	0.0	0.0	4.1	27.5	85	0.0	26.2
Yorktown clay: (S80LA-67-8)	2-0	01	5.3	5.00	63	19.3	5.8	0.9	0.4	0.1	0.4	30.8	57.2	46	0.4	0.7
	0-7	A1	5.0	4.33	135	12.0	5.0	1.1	0.3	2.1	0.7	23.6	42.0	44	9.9	0.7
	7-17	B21g	4.6	1.35	81	10.8	5.3	1.0	0.2	4.8	0.7	18.1	35.4	49	21.0	0.6
	17-30	B22g	4.7	0.77	51	10.2	6.3	1.1	0.2	8.6	1.0	24.6	42.4	42	31.4	0.5
	30-48	B23g	4.6	0.39	69	17.2	8.3	1.3	0.3	4.9	1.1	22.5	49.6	55	14.8	0.6
	48-60	B3	5.0	0.48	65	16.1	8.3	1.1	0.2	1.8	0.7	14.6	40.3	64	6.4	0.5

*Percent saturation of Al was calculated by dividing the extractable aluminum by the total amount of extractable cations.
**Percent saturation of Na was calculated by dividing the extractable sodium by the cation-exchange capacity.

TABLE 20.--PHYSICAL TEST DATA ON SELECTED SOILS

[The symbol TR means trace. Dashes indicate analysis not made]

Soil and sample number	Horizon	Depth from surface	Particle-size distribution (mm): Sand: Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.10)	Very fine (0.10-0.05)	Total (2.0-0.05)	Silt (0.05-0.002)	Clay (0.002)	Fine clay (0.0002)	Water content at tension: 1/3 Bar	15 Bar	Bulk density: 1/3 Bar	Oven-dry	Field moisture
		In	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	G/cm3	G/cm3	G/cm3
Bussy silt loam: (S78LA-67-3)*	A1	0-4	0.8	0.5	0.7	5.8	11.7	19.5	69.9	10.6	5.1	36.0	7.4	1.00	1.13	---
	B1	4-9	1.4	0.6	0.6	4.9	11.2	18.7	64.5	16.8	10.6	20.5	6.8	1.56	1.59	---
	B21t	9-15	0.5	0.4	0.5	4.8	10.1	16.3	64.5	19.2	11.0	21.3	8.0	1.50	1.55	---
	B22t	15-22	0.8	0.6	0.6	4.2	9.5	15.7	63.0	21.3	13.1	22.0	8.4	1.50	1.54	---
	B23t	22-29	1.0	0.5	0.4	3.5	9.0	14.4	62.2	23.4	14.8	21.9	9.5	1.51	1.56	---
	B23t	29-35	1.0	0.3	0.4	3.9	8.3	13.9	61.0	25.1	16.9	23.0	10.3	1.48	1.52	---
	Bx1	35-45	0.7	0.3	0.4	4.3	10.0	15.7	61.3	23.0	14.8	18.5	8.9	1.66	1.71	---
	Bx2	45-56	0.8	0.1	0.4	4.1	9.4	14.8	57.7	27.5	18.9	21.1	11.5	1.56	1.70	---
	Bx3	56-65	0.9	0.3	0.5	4.7	10.8	17.2	60.3	22.5	15.9	23.3	10.4	1.48	1.61	---
Debute silt loam: (S78LA-67-2)*	A11	0-2	0.1	0.3	5.3	20.0	6.6	32.3	58.7	9.0	5.2	---	7.8	---	---	---
	A12	2-8	0.1	0.4	2.2	13.0	4.0	19.7	67.2	13.1	6.6	20.4	5.8	1.44	1.47	---
	B21t	8-18	0.1	0.2	2.4	7.6	3.0	13.3	62.0	24.7	15.3	21.0	10.7	1.39	1.44	---
	B22t	18-27	---	0.2	1.8	10.6	3.4	16.0	56.7	27.3	17.8	22.5	12.4	1.49	1.56	---
	IIBx1	27-37	TR	0.3	5.3	17.1	6.4	29.1	52.5	18.4	11.5	18.0	8.2	1.67	1.72	---
	IIBx2	37-53	0.1	0.3	7.7	26.3	8.6	43.0	39.9	17.1	13.5	---	6.8	1.79	1.79	---
	IIBx3	53-70	TR	0.2	7.7	26.2	9.2	43.3	34.3	22.4	18.8	17.3	10.0	1.74	1.81	---
	IIB23t	70-90	TR	0.2	8.8	35.2	9.9	54.1	24.3	21.6	---	---	8.9	1.70	---	---
Goodwill silt loam: (S80LA-67-1)**	Ap	0-5	0.2	0.5	1.7	17.9	9.8	30.0	53.0	17.0	---	25.4	8.3	---	1.65	1.55
	B21t	5-9	0.4	0.4	1.0	10.3	10.8	23.0	51.5	24.5	---	25.4	10.8	---	1.76	1.63
	B22t	9-18	0.3	0.7	1.0	7.2	4.8	14.0	56.0	30.0	---	29.5	13.5	---	1.64	1.51
	B23t	18-28	1.0	2.0	1.7	9.8	5.2	19.8	54.1	26.1	---	29.7	12.4	---	1.61	1.49
	IIB24t	28-42	0.1	0.1	1.7	26.7	11.1	39.7	39.7	20.6	---	23.5	9.4	---	1.73	1.66
	IIB25t	42-56	---	0.1	2.5	37.4	15.3	55.2	30.3	14.5	---	16.9	7.2	---	1.73	1.68
	IIB3	56-72	---	---	3.1	46.9	20.1	70.1	15.8	14.1	---	16.6	7.0	---	1.75	1.69
Groom very fine sandy loam: (S80LA-67-3)**	Ap	0-5	0.1	0.4	0.8	4.5	47.7	53.4	34.6	12.0	---	18.2	4.5	---	1.37	1.34
	B1g	5-12	TR	0.1	0.2	1.9	29.5	31.6	35.3	23.1	---	22.8	7.6	---	1.54	1.48
	B21tg	12-26	0.1	0.1	0.1	1.2	12.0	13.4	61.5	25.1	---	27.0	11.0	---	1.73	1.63
	B22t	26-33	1.1	0.9	0.5	1.5	10.0	14.0	60.4	25.6	---	25.6	12.6	---	1.71	1.61
	B23tg	33-48	0.5	0.4	0.4	1.5	9.9	12.7	57.1	30.2	---	27.4	13.8	---	1.85	1.74
	B24tg	48-78	0.2	0.2	0.1	1.2	11.5	13.2	55.9	30.9	---	28.1	14.5	---	1.79	1.71
Idee silt loam: (S80LA-67-2)**	Ap	0-6	0.3	0.4	0.7	3.8	5.2	10.3	69.9	19.8	---	25.9	9.8	---	1.53	1.33
	B21t	6-16	0.1	0.1	0.3	2.8	2.1	5.4	69.5	25.1	---	27.7	11.5	---	1.73	1.58
	B22t	16-34	0.6	0.8	0.6	3.0	1.9	6.9	58.0	35.2	---	30.3	14.7	---	1.78	1.45
	B23t	34-44	0.6	0.9	0.8	4.5	2.8	9.7	60.2	30.1	---	27.5	13.4	---	1.70	1.59
	IIB24tb	44-56	0.1	0.3	0.8	9.8	6.5	17.4	61.7	20.8	---	25.4	11.5	---	1.67	1.61
	IIB25tb	56-70	---	---	0.2	28.7	16.9	45.8	36.2	18.0	---	19.5	8.3	---	1.78	1.74

TABLE 20.--PHYSICAL TEST DATA ON SELECTED SOILS

Soil and sample number	Horizon	Depth from surface	Particle-size distribution (mm): Sand: Very coarse (2.0-1.0)	Sand: Coarse (1.0-0.5)	Sand: Medium (0.5-0.25)	Sand: Fine (0.25-0.10)	Sand: Very fine (0.10-0.05)	Sand: Total (2.0-0.05)	Silt (0.05-0.002)	Clay (0.002)	Fine clay (0.0002)	Water content at tension: 1/3 Bar	Water content at tension: 15 Bar	Bulk density: 1/3 Bar	Bulk density: Oven-dry	Bulk density: Field moisture
		In	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	G/cm3	G/cm3	G/cm3
Libuse silt loam: (S78LA-67-1)*	A1	0-4	0.6	0.4	0.6	10.0	16.3	27.9	65.9	6.2	3.7	23.0	4.4	1.51	1.52	---
	B1	4-7	0.1	0.3	0.5	8.5	11.8	21.2	63.3	15.5	8.6	18.8	6.2	1.57	1.59	---
	B21t	7-12	0.1	0.2	0.5	6.6	10.2	17.6	58.9	23.5	16.1	19.8	10.8	1.50	1.55	---
	B21t	12-20	0.2	0.2	0.5	7.0	10.6	18.5	57.2	24.3	16.5	22.0	11.5	1.45	1.51	---
	B22t	20-27	0.9	0.4	0.5	9.0	14.7	25.5	56.5	18.0	13.1	21.7	8.7	1.46	1.51	---
	Bx1	27-40	0.2	0.2	0.5	10.5	15.9	27.3	56.8	15.9	12.6	16.5	7.0	1.68	1.72	---
	Bx2	40-51	0.1	0.3	0.4	9.1	15.2	25.1	54.0	20.9	14.4	16.8	9.3	1.68	1.72	---
	Bx3	51-60	0.3	0.2	0.5	8.9	14.2	24.1	51.6	24.3	16.5	19.2	11.2	1.63	1.72	---
	B3	60-70	0.2	0.2	0.3	8.7	14.2	23.6	52.2	24.2	15.6	19.1	12.2	1.62	1.70	---
Mollicy loam: (S80LA-67-4)**	Ap	0-5	0.5	0.3	2.8	38.0	8.5	50.1	38.3	11.6	---	17.0	4.9	---	1.68	1.69
	B21t	5-14	0.3	0.3	1.3	26.5	5.1	33.6	41.6	24.8	---	24.1	10.1	---	1.74	1.64
	B22t	14-26	0.7	1.3	2.4	22.8	4.6	31.9	39.3	28.8	---	24.5	11.6	---	1.78	1.63
	B23t	26-34	0.4	0.6	2.2	28.3	5.1	36.6	34.7	28.7	---	22.5	11.8	---	1.76	1.70
	IIB24t	34-46	TR	TR	2.6	44.2	7.2	54.0	20.0	26.0	---	17.3	10.0	---	1.82	1.75
	IIB31t	46-62	TR	TR	2.9	58.4	7.1	68.4	14.9	16.6	---	12.6	6.5	---	1.80	1.77
	IIB32	62-76	---	---	1.2	75.0	6.0	82.2	5.0	12.8	---	9.6	5.1	---	1.69	1.65
	IIB33	76-90	---	---	3.1	77.0	4.1	84.3	4.2	11.5	---	9.9	5.0	---	1.72	1.69
Tillou silt loam: (S78LA-67-4)*	A1	0-5	1.7	1.1	1.5	6.0	6.6	16.9	71.2	11.9	5.5	29.9	7.3	1.18	1.25	---
	A2	5-8	1.6	0.9	1.3	4.8	4.9	13.5	68.8	17.7	9.5	23.9	7.2	1.44	1.50	---
	B21t	8-15	1.7	0.8	1.2	4.3	4.8	12.8	65.9	21.3	9.0	23.4	8.5	1.42	1.47	---
	B&A	15-20	1.3	0.7	1.1	4.3	4.4	11.8	66.5	21.7	9.4	24.4	8.5	1.44	1.50	---
	A&B	20-30	2.1	0.8	1.2	4.2	4.6	12.9	65.9	21.2	13.1	23.4	8.5	1.51	1.54	---
	B'22t	30-40	1.3	0.7	1.0	3.7	3.9	10.6	58.1	31.3	21.9	22.8	13.4	1.53	1.63	---
	IIB'23t	40-48	1.1	0.8	1.0	3.4	3.7	10.0	56.6	33.4	22.7	24.7	14.7	1.44	1.62	---
	IIB'24t	48-66	1.0	0.6	1.5	7.0	7.7	17.8	58.9	23.3	15.1	22.7	10.4	1.58	1.69	---
	IIB'25t	66-76	1.2	0.8	1.4	6.4	8.0	17.8	58.4	23.8	16.0	24.1	11.2	1.56	1.70	---

*Analysis by the National Soil Survey Laboratory, Soil Conservation Service, USDA.
**Analysis by the Soil Characterization Laboratory, Louisiana Agricultural Experiment Station.

TABLE 21.--CHEMICAL TEST DATA ON SELECTED SOILS

[The symbol TR means trace. Dashes indicate analysis not made]

Soil and sample number	Horizon	Depth from surface	Extractable bases: Ca	Extractable bases: Mg	Extractable bases: K	Extractable bases: Na	Extractable acidity	Cation exchange capacity (NH_4OAc)	Base saturation (NH_4OAc)	Organic carbon	pH 1:1 H_2O	pH 1:1 KCl	pH 1:2 $CaCl_2$	Extractable iron	Extractable aluminum	Extractable hydrogen	Extractable phosphorus
		In	Meq/100g						Pct	Pct				Pct	Meq/100g		Ppm
Bussy silt loam: (S78LA-67-3)*	A1	0-4	5.6	0.8	0.1	---	6.6	9.8	66.0	2.53	5.5	4.9	5.1	0.9	0.1	---	---
	B1	4-9	0.9	0.6	TR	---	6.4	6.8	22.0	0.36	4.7	3.8	4.0	1.6	2.6	---	---
	B21t	9-15	0.3	0.7	---	---	7.5	7.5	13.0	0.22	4.6	3.6	3.8	1.5	4.1	---	---
	B22t	15-22	0.1	0.8	---	TR	8.0	8.0	11.0	0.15	4.7	3.6	3.8	1.7	4.6	---	---
	B23t	22-29	0.2	1.1	TR	0.1	9.0	9.1	15.0	0.15	5.0	3.6	3.9	1.6	5.2	---	---
	B23t	29-35	0.2	1.2	0.1	0.2	9.7	10.5	16.0	0.13	5.0	3.5	3.9	1.6	5.8	---	---
	Bx1	35-45	0.5	1.0	TR	0.2	8.7	9.4	18.0	0.10	5.2	3.5	3.9	1.5	5.2	---	---
	Bx2	45-56	1.2	1.9	0.1	0.7	8.5	11.4	34.0	0.11	5.3	3.4	3.9	1.3	4.3	---	---
	Bx3	56-65	2.5	3.0	TR	1.2	3.7	9.9	68.0	0.08	5.8	3.6	4.4	1.0	---	---	---
Debute silt loam: (S78LA-67-2)*	A11	0-2	4.8	1.7	0.4	---	7.1	10.5	66.0	3.08	5.7	4.9	5.2	0.7	---	---	---
	A12	2-8	1.0	0.6	0.1	---	5.3	5.6	30.0	0.44	5.1	4.1	4.4	0.9	0.5	---	---
	B21t	8-18	2.2	2.7	0.1	TR	5.7	9.0	56.0	0.14	5.2	4.0	4.5	1.8	0.6	---	---
	B22t	18-27	1.7	3.3	0.2	TR	7.4	10.4	50.0	0.17	5.0	3.9	4.3	2.1	1.6	---	---
	IIBx1	27-37	0.9	2.0	0.1	TR	5.0	6.8	44.0	0.08	5.1	3.9	4.3	1.4	1.2	---	---
	IIBx2	37-53	0.5	1.6	0.1	TR	4.0	5.4	41.0	0.06	5.1	3.9	4.2	1.2	1.4	---	---
	IIBx3	53-70	0.1	1.9	0.1	TR	5.9	7.1	30.0	0.05	5.2	3.7	4.0	1.5	2.5	---	---
	IIB23t	70-90	0.1	1.6	TR	TR	5.3	6.3	27.0	0.04	4.9	3.6	4.0	1.3	2.6	---	---
Goodwill silt loam: (S80LA-67-1)**	Ap	0-5	4.0	3.1	0.2	TR	6.8	11.7	60.9	1.30	4.8	4.2	4.6	0.8	0.1	0.1	41.3
	B21t	5-9	3.9	3.8	0.1	TR	7.1	12.1	65.0	0.30	4.8	3.7	4.3	1.1	1.0	0.3	20.7
	B22t	9-18	4.4	4.7	0.1	0.1	8.1	14.0	66.6	0.20	4.9	3.9	4.5	1.3	0.8	0.1	24.7
	B23t	18-28	3.8	4.8	0.1	0.1	7.5	14.0	62.9	0.20	4.9	3.8	4.4	1.3	1.0	0.1	20.4
	IIB24t	28-42	2.1	5.0	0.1	0.4	7.4	10.4	71.7	0.10	4.8	3.5	4.1	1.1	2.1	0.1	14.3
	IIB25t	42-56	1.2	2.5	0.1	0.5	6.1	7.9	53.2	0.10	4.9	3.4	4.2	0.8	2.1	TR	24.5
	IIB3	56-72	1.0	2.8	0.1	0.8	5.7	7.8	60.6	0.10	4.8	3.3	4.0	0.7	1.7	0.3	34.8
Groom very fine sandy loam: (S80LA-67-3)**	Ap	0-5	4.6	1.1	0.1	TR	2.4	6.2	91.9	1.00	6.7	5.8	6.3	0.3	0.1	TR	45.7
	B1g	5-12	1.0	0.4	TR	0.1	11.1	9.2	16.6	0.40	4.1	3.2	3.7	0.7	6.2	0.3	0.8
	B21tg	12-26	0.7	0.6	TR	0.6	15.3	12.1	16.1	0.20	4.2	3.0	3.5	0.9	9.3	0.2	0.6
	B22t	26-33	2.2	2.6	TR	2.2	11.4	14.5	48.4	0.10	4.6	2.9	3.7	0.6	6.4	0.6	0.7
	B23tg	33-48	3.1	4.7	0.1	4.1	10.3	16.2	73.8	0.10	4.4	2.9	3.8	0.5	5.2	0.2	0.2
	B24tg	48-78	3.6	6.1	0.1	6.1	8.4	16.4	96.2	0.10	4.4	3.0	4.1	0.9	3.1	0.2	0.7
Idee silt loam: (S80LA-67-2)**	Ap	0-6	5.9	3.8	0.2	TR	7.8	15.1	65.6	1.30	4.2	4.7	5.9	0.6	0.1	TR	64.1
	B21t	6-16	6.0	4.7	0.1	TR	7.3	15.3	70.8	0.30	3.6	4.4	6.0	0.8	0.9	0.3	12.6
	B22t	16-34	6.6	7.0	0.1	0.1	7.3	19.5	71.3	0.20	5.1	3.9	4.9	1.5	0.3	0.2	0.8
	B23t	34-44	6.1	6.9	0.1	0.2	6.1	16.9	77.3	0.20	5.6	4.3	5.2	1.3	0.1	0.1	10.8
	IIB24tb	44-56	5.2	6.1	0.1	0.2	5.2	14.6	76.7	0.10	5.9	4.4	5.4	1.2	0.1	TR	15.1
	IIB25tb	56-70	3.8	4.7	0.1	0.2	3.5	9.4	92.7	0.10	6.1	4.5	5.5	0.9	0.1	TR	13.4

TABLE 21.--CHEMICAL TEST DATA ON SELECTED SOILS--Continued

Soil and sample number	Horizon	Depth from surface	Extractable bases: Ca	Extractable bases: Mg	Extractable bases: K	Extractable bases: Na	Extractable acidity	Cation exchange capacity (NH$_4$OAc)	Base saturation (NH$_4$OAc)	Organic carbon	pH 1:1 H_2O	pH 1:1 KCl	pH 1:2 $CaCl_2$	Extractable iron	Extractable aluminum	Extractable hydrogen	Extractable phosphorus
		In	Meq/100g	Meq/100g	Meq/100g	Meq/100g	Meq/100g	Meq/100g	Pct	Pct				Pct	Meq/100g	Meq/100g	Ppm
Libuse silt loam: (S78LA-67-1)*	A1	0-4	1.2	0.3	0.1	---	4.3	6.0	27.0	1.45	5.6	4.8	5.1	0.9	---	---	---
	B1	4-7	2.6	0.6	0.1	---	3.5	5.9	56.0	0.19	5.3	4.2	4.6	1.1	0.3	---	---
	B21t	7-12	4.8	1.2	0.2	---	5.2	9.3	67.0	0.31	5.2	4.0	4.5	1.8	0.5	---	---
	B21t	12-20	5.0	1.6	0.2	---	4.8	10.5	65.0	0.19	5.3	4.1	4.7	2.0	0.3	---	---
	B22t	20-27	3.3	1.5	0.1	---	4.2	7.9	62.0	0.08	5.2	4.0	4.5	1.4	0.6	---	---
	Bx1	27-40	1.1	1.0	TR	0.1	5.3	7.0	31.0	0.01	5.1	3.7	4.1	1.1	2.9	---	---
	Bx2	40-51	0.9	1.4	TR	0.4	7.9	9.8	28.0	0.01	5.2	3.5	3.9	1.2	4.7	---	---
	Bx3	51-60	2.0	2.6	TR	1.0	7.0	12.0	47.0	0.01	5.2	3.4	4.0	1.2	3.6	---	---
	B3	60-70	3.0	3.0	0.1	1.5	5.0	12.4	65.0	TR	5.0	3.2	4.0	1.3	2.0	---	---
Mollicy loam: (S80LA-67-4)**	Ap	0-5	1.5	0.5	0.1	TR	6.1	6.8	35.1	1.00	4.2	3.6	4.0	0.3	1.5	0.1	2.2
	B21t	5-14	0.3	0.6	TR	TR	12.1	9.1	1.0	0.30	3.9	3.3	3.6	1.1	6.8	0.5	0.6
	B22t	14-26	TR	0.9	TR	TR	14.7	12.5	0.8	0.10	4.0	3.2	3.6	1.1	8.7	0.3	TR
	B23t	26-34	TR	0.9	TR	0.1	14.8	12.6	0.7	0.10	4.0	3.1	3.6	1.2	9.5	0.2	TR
	IIB24t	34-46	TR	0.9	TR	0.1	13.5	11.5	0.8	0.10	4.3	3.1	3.5	1.0	8.6	TR	TR
	IIB31t	46-62	TR	0.6	0.1	TR	8.9	7.8	0.9	0.10	4.4	3.1	3.5	0.6	5.7	0.3	TR
	IIB32	62-76	TR	0.6	0.1	0.1	6.9	6.2	1.1	0.10	4.3	3.2	3.6	0.5	4.3	0.4	1.7
	IIB33	76-90	TR	0.6	0.1	TR	6.4	5.7	13.0	0.10	4.2	3.3	3.6	0.7	4.0	0.3	1.9
Tillou silt loam: (S78LA-67-4)*	A1	0-5	2.7	1.0	0.1	---	8.0	9.4	40.0	2.00	5.3	4.2	4.6	1.3	0.4	---	---
	A2	5-8	1.9	1.1	TR	---	6.3	8.2	37.0	0.39	4.9	3.7	4.1	1.9	2.0	---	---
	B21t	8-15	1.2	1.1	TR	---	7.8	8.9	26.0	0.26	4.8	3.6	4.0	2.0	3.4	---	---
	B&A	15-20	0.9	1.2	0.1	0.1	8.2	8.9	26.0	0.16	4.8	3.6	3.9	1.7	3.6	---	---
	A&B	20-30	0.6	1.2	0.1	0.3	8.0	8.9	25.0	0.15	5.2	3.6	3.9	1.7	4.1	---	---
	B'22t	30-40	1.7	3.1	0.1	1.2	9.2	13.8	44.0	0.11	5.4	3.3	4.0	1.8	5.0	---	---
	IIB'23t	40-48	2.5	3.9	0.1	1.8	8.4	15.6	53.0	0.10	5.4	3.3	4.1	1.5	3.6	---	---
	IIB'24t	48-66	3.2	3.4	0.1	2.1	3.0	10.8	81.0	0.10	6.1	3.8	4.8	1.1	---	---	---
	IIB'25t	66-76	3.8	3.5	0.1	2.5	2.1	11.4	87.0	0.10	6.6	4.3	5.4	1.1	---	---	---

*Analysis by the National Soil Survey Laboratory, Soil Conservation Service, USDA.
**Analysis by the Soil Characterization Laboratory, Louisiana Agricultural Experiment Station.

TABLE 22.--MINERAL COMPOSITION OF THE CLAY FRACTION OF SELECTED SOILS

[Based on X-ray diffraction of soils analyzed by the National Soil Survey Laboratory, Soil Conservation Service, USDA. The symbol < means less than]

Soil name and sample number	Depth from surface	Horizon	Relative amounts of minerals* (< 2.0 microns)
	In		
Bussy silt loam: (S78LA-67-3)	4-9	B1	KK2, VR1
	15-22	B22t	KK3, VR1, MI1, GE1
	29-35	B23t	KK3, MI1, GE1
	45-56	Bx2	KK4, VM3, MI2, MT2
Debute silt loam: (S78LA-67-2)	2-8	A12	KK2, MI1, QZ1
	18-27	B22t	KK2, MI2, GE1, QZ1
	53-70	IIBx3	KK2, MI1, QZ1
Libuse silt loam: (S78LA-67-1)	4-7	B1	VR2, KK2, MI1, QZ1
	12-20	B21t	KK3, MI2
	51-60	Bx3	KK3, MI2, QZ1
Tillou silt loam: (S78LA-67-4)	5-8	A2	KK2, MI1, MT1
	8-15	B21t	KK3, VR2, MI1, QZ1
	48-66	IIB'24t	MV3, KK3, MI1

*In this column the alphabetical letter represents the kind of mineral, and the number represents the relative amount of the mineral. Minerals are listed in order of decreasing abundance.

Kind of mineral

GE--Goethite
KK--Kaolinite
MI--Mica
MT--Montmorillonite
MV--Montmorillonite-Vermiculite
QZ--Quartz
VM--Vermiculite-mica
VR--Vermiculite

Relative amount of mineral

1--Trace
2--Small (less than 10 percent)
3--Moderate (10 to 40 percent)
4--Abundant (greater than 40 percent)

TABLE 23.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Allemands	Clayey, montmorillonitic, euic, thermic Terric Medisaprists
Bussy	Fine-silty, siliceous, thermic Typic Fragiudalfs
Cascilla	Fine-silty, mixed, thermic Fluventic Dystrochrepts
Debute	Fine-silty, mixed, thermic Typic Fragiudults
Dexter	Fine-silty, mixed, thermic Ultic Hapludalfs
Forestdale	Fine, montmorillonitic, thermic Typic Ochraqualfs
Frizzell	Coarse-silty, siliceous, thermic Glossaquic Hapludalfs
Gallion	Fine-silty, mixed, thermic Typic Hapludalfs
Goodwill	Fine-silty, mixed, thermic Ultic Hapludalfs
Groom	Fine-silty, siliceous, thermic Aeric Ochraqualfs
Guyton	Fine-silty, siliceous, thermic Typic Glossaqualfs
Haggerty	Coarse-loamy, siliceous, thermic Aeric Ochraquults
Hebert	Fine-silty, mixed, thermic Aeric Ochraqualfs
Idee	Fine-silty, mixed, thermic Aeric Ochraqualfs
Lafe	Fine-silty, mixed, thermic Glossic Natrudalfs
Libuse	Fine-silty, siliceous, thermic Typic Fragiudalfs
Litro	Fine, mixed, acid, thermic Vertic Haplaquepts
Mer Rouge	Fine-silty, mixed, thermic Typic Argiudolls
Mollicy	Fine-loamy, siliceous, thermic Aquic Hapludults
Perry	Very-fine, montmorillonitic, nonacid, thermic Vertic Haplaquepts
Portland	Very-fine, mixed, nonacid, thermic Vertic Haplaquepts
Rilla	Fine-silty, mixed, thermic Typic Hapludalfs
Sterlington	Coarse-silty, mixed, thermic Typic Hapludalfs
Tillou	Fine-silty, mixed, thermic Aquic Glossudalfs
Udalfs	Udalfs
*Wrightsville	Fine, mixed, thermic Typic Glossaqualfs
*Yorktown	Very-fine, montmorillonitic, nonacid, thermic Typic Fluvaquents

* In Morehouse Parish, this soil is a taxadjunct to the series. See text for description of its characteristics that are outside the range of the series.

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