United States
Department of
Agriculture

Soil
Conservation
Service

In cooperation with
Louisiana Agricultural
Experiment Station

Soil Survey of Livingston Parish, Louisiana

How To Use This Soil Survey

General Soil Map

The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

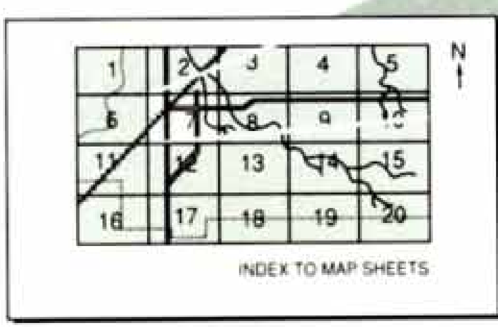
To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.

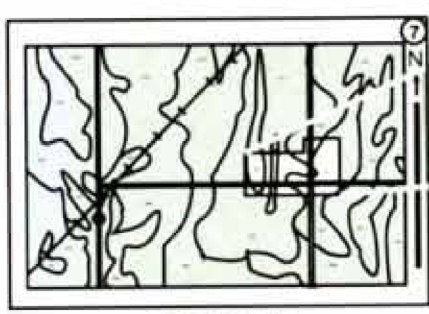
MAP SHEET

To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet, and turn to that sheet.

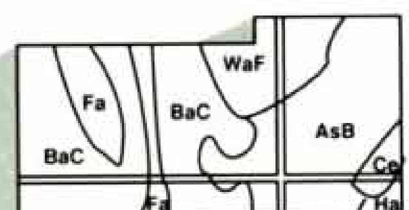


INDEX TO MAP SHEETS

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Index to Map Units** (see Contents), which lists the map units by symbol and name and shows the page where each map unit is described.



MAP SHEET



AREA OF INTEREST

NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1987. Soil names and descriptions were approved in 1987. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1987. This soil survey was made cooperatively by the Soil Conservation Service and the Louisiana Agricultural Experiment Station. It is part of the technical assistance furnished to the Capital Soil and Water Conservation District.

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

All programs and services of the Soil Conservation Service are offered on a nondiscriminatory basis, without regard to race, color, national origin, religion, sex, age, marital status, or handicap.

Cover: A stand of pine on Satsuma silt loam, 1 to 3 percent slopes. Woodland is a major land use in the survey area. Photo courtesy of the Louisiana Department of Agriculture and Forestry.

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Issued January 1991

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Foreword

This soil survey contains information that can be used in land-planning programs in Livingston 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 ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

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

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

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Soil Survey of
Livingston Parish, Louisiana

By Donald McDaniel, Soil Conservation Service

Fieldwork by Donald McDaniel, Dennis Daugereaux, Wilton Stephens, Cynthia Corkern, and Betty McQuaid, Soil Conservation Service

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

Livingston Parish is in the southeastern part of Louisiana (fig. 1). It has a total area of 458,204 acres, 32,604 acres of which consists of lakes, bayous, and rivers. St. Helena Parish borders this parish on the north, and Lake Maurepas, Ascension, and St. John Parishes are on the south. To the east is Tangipahoa Parish, and to the west is East Baton Rouge Parish. According to the 1980 census, the population of the parish was 58,806. About 79 percent of the population lives in rural areas. Land use is primarily woodland and pasture. About 81 percent of the land area in the parish is woodland, and 3 percent is pasture. Currently, rapid urban expansion, particularly in the central and western parts of the parish, is a trend.

The parish consists of three Major Land Resource Areas (MLRA's). The Southern Mississippi Valley Silty Uplands MLRA is used mainly as woodland, as pasture, and for truck crops. This MLRA consists dominantly of poorly drained and somewhat poorly drained, loamy soils in the northern part and poorly drained and somewhat poorly drained, loamy over clayey soils in the southern part. The Eastern Gulf Coast Flatwoods MLRA is used mainly as woodland. The Southern Mississippi Valley Alluvium MLRA is used mainly as habitat for wetland wildlife and as a recreation area. This MLRA consists dominantly of poorly drained and somewhat poorly drained, loamy soils. This MLRA consists mainly of ponded, mucky soils in swamps. Elevation is about 100 feet above sea level in the Southern Mississippi Valley Silty Uplands MLRA and at sea level in the swamps of the Southern Mississippi Valley Alluvium MLRA.

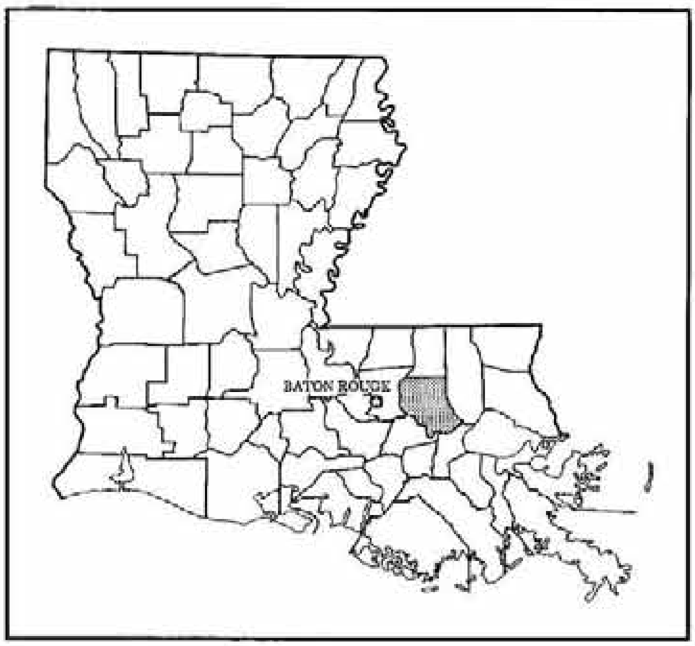

Figure 1.—Location of Livingston Parish in Louisiana.

Descriptions and names of soils in this survey do not fully agree with those on soil maps for adjacent parishes. Differences are the result of better information on soils, modifications in series concepts, and variations in the intensity of mapping or the extent of soils within the survey area.

The first soil survey of Livingston Parish was published in 1936 *(4)*. This survey updates the earlier survey and provides additional information.

General Nature of the Parish

This section discusses climate, agriculture, history, transportation facilities, and water resources in the survey area.

Climate

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

Table 1 gives data on temperature and precipitation for the survey area as recorded at Amite, Louisiana, in the period 1951 to 1979. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 51 degrees F and the average daily minimum temperature is 40 degrees. The lowest temperature on record, which occurred at Amite on January 12, 1962, is 9 degrees. In summer, the average temperature is 81 degrees and the average daily maximum temperature is 92 degrees. The highest recorded temperature, which occurred at Amite on July 1, 1954, is 104 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is about 64 inches. Of this, nearly 34 inches, or about 53 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 27 inches. The heaviest 1-day rainfall during the period of record was 8.55 inches at Amite on September 6, 1977. Thunderstorms occur on about 70 days each year.

Snowfall is rare. In 90 percent of the winters, there is no measurable snowfall. In 10 percent, the snowfall, usually of short duration, is more than 2 inches. The heaviest 1-day snowfall on record was more than 3 inches.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 90 percent. The sun shines 70 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the southeast. Average windspeed is highest, 10 miles per hour, in spring.

Agriculture

In Livingston Parish, farming has been important since the earliest settlers arrived in 1750. At first, products were grown strictly for home use. Later, some farm products were shipped by river to New Orleans. In 1880, 561 farms were in the county and the average farm was 179 acres. About 21 acres on a farm was improved for cultivation. Corn, cotton, sweet potatoes, rice, sugarcane, and oats were grown on the better drained soils, especially those along the Amite River and along the other rivers.

In 1930, the county's 2,193 farms averaged about 210 acres in size. About 13.5 acres on each farm was improved for use as cropland and pasture. The main crops grown were corn, strawberries, sweet potatoes, cotton, and Irish potatoes. Truck crops, mainly strawberries, were important cash crops. In 1930, about 4,471 acres was planted to strawberries. Most of the virgin timber had been cut, and a new growth of trees covered at least 70 percent of the land. Most of the livestock in the parish found forage in the woods *(25)*.

Most of Livingston Parish is woodland. In 1986, however, the total value of timber produced in the parish was less than that of poultry. In 1986, broilers and edible eggs produced on 27 farms were valued at a total of $11,896,125. Also in that year, timber products sold were valued at $10,900,852. Christmas trees were grown on 20 farms on 120 acres and had a value of $120,000. In 1986, 7,000 cow-calf units were in the parish and ten swine producers had 130 sows. Five dairies produced 4,120,000 pounds of milk for a total value of $484,100.

In 1986, about 40 producers grew, on 100 acres, strawberries that had a total value of $1,120,000 (fig. 2). About 30 producers produced 12,000 bushels each of cucumbers and bell peppers for a total value of $168,000 *(25)*. Also, crawfish and catfish were commercially produced on a small acreage.

History

Livingston Parish was established as a political unit in 1832. The parish seat was originally at Van Buren on

Figure 2.—Strawberries on Cahaba fine sandy loam, 1 to 3 percent slopes.

the "right bank of the Tickfaw River." Later, the parish seat was moved to Springfield, an important commercial center and shipping point and the largest settlement between New Orleans and Baton Rouge. The parish seat was later moved to Port Vincent, where the parish records were lost when the courthouse burned down. The town of Centerville, or Springville, on the Tickfaw River, became the next parish seat and remained so for 61 years. Today, the parish seat is in Livingston.

Settlers of French, Spanish, and English descent established the early permanent settlements in Livingston Parish. The French and Spanish settled mainly in the southern part of the parish, and the English settled in the northern part.

From the 1750's to the early 1800's, settlements were established at Denson, French Settlement, Maurepas, Port Vincent, and Whitehall. Prior to 1800, Bookter's Landing, now known as Springfield, was a trading post on the Natalbany River. In 1827, William Denham discovered mineral springs on his property, near the Amite River, and developed a health resort at the site of present-day Denham Springs. The resort remained until the Civil War, when occupying Federal troops destroyed it. In 1861, Michael Milton blazed a trail from the Amite River and established a settlement, originally called Milton Oldfield and later called Walker.

In September 1810, the Springfield Grenadiers played an important role in the conflict known as the "Florida Rebellion." The Grenadiers attacked the occupying Spanish forces at Baton Rouge and won the independence of West Florida. In December, the flag of the United States was raised over the area now referred to as the "Florida Parishes."

Most of the early residents of the parish lived on subsistence farms, seldom making purchases. They raised poultry, swine, and cows as well as food and feed crops. Hunting, trapping, and fishing were also important to their livelihood. To the settlers along the banks of the Amite, Tickfaw, and Natalbany Rivers, the native timber was a source of income. The timber was shipped on waterways.

With the coming of the railroad, many miles of track were laid and many sawmills were built in the parish. In 1908, a railroad was built from Hammond to Baton Rouge. The communities of Doyle, Holden, and Livingston were established along the rail line and thrived as logging and sawmill towns. Springfield became an important lumber shipping point.

In the late 1890's, many lumberjacks bought cutover land near the crossroads community of Albany and began to farm it. These settlers named their settlement Arpadon, after Arped, the legendary hero of Hungary. They farmed successfully, and many of their descendants still farm in this area. A sign on Louisiana Highway 43, near the eastern border of the parish, marks the site of the original settlement.

Many of the early communities and towns either disappeared or dwindled in size as the sawmills closed and people moved to nearby New Orleans or Baton Rouge. Springfield, the first town established in the parish, has become a small community of about 600 people. The old courthouse and hotel stand as reminders of the community of some 2,400 people.

Farming is a major factor in the economy of the parish. Livestock, poultry, cash crops, and lumber are the main agricultural products. However, fewer and larger holdings have replaced the small subsistence farms. Most workers in the parish commute daily to jobs in cities in neighboring parishes.

Transportation Facilities

Interstate 12, U.S. Highway 190, and many paved state and parish highways serve the parish. An east-west mainline of the Illinois Central Gulf Railroad also runs through the parish.

In the southern part of the parish, the Natalbany, Tickfaw, Amite, and Blind Rivers and the Amite River Diversion Canal provide water transportation.

Water Resources

Darrell D. Carlson and Robert B. Fendick, Jr., U.S. Geological Survey, Baton Rouge, Louisiana, helped prepare this section.

Surface Water

The major sources of surface water in the parish are the Natalbany, Tickfaw, and Amite Rivers, which flow south-southeastward across Livingston Parish, and their tributaries (Hog Branch, Blood River, Colyell Creek, and Little Natalbany River). The Tickfaw River has an average annual discharge, near Holden, of 268,100 acre-feet per year (1940-85). The Natalbany River, a major tributary of the Tickfaw River, drains the eastern part of the parish. It has an average annual discharge, near Albany, of 83,300 acre-feet per year (1943-85). The Amite River forms the western boundary of the parish and is the major source of streamflow. Its average annual discharge, near Denham Springs, is 1,460,700 acre-feet per year (1938-85).

Flooding is a major problem in Livingston Parish; extreme flooding occurred in 1983. On April 7 of that year, the three rivers had maximum rates of discharge. On the Tickfaw River at Holden, the maximum discharge was 22,470 cubic feet per second, the volume of a 40-year flood. On the Amite River near Denham Springs, the maximum discharge was 112,000 cubic feet per second, the volume of a 50-year flood. On the Natalbany River at Baptist, the maximum discharge of 9,810 cubic feet per second was equal to a 35-year flood.

The water in the Amite River periodically contains high concentrations of coliform bacteria. It also contains relatively high concentrations of copper, iron, zinc, and manganese. These results were shown from water-quality samples collected in 1985 at the 4-H camp near Denham Springs.

Ground Water

Fresh ground water lies in aquifers as deep as 3,200 feet below mean sea level in the southeastern part of Livingston Parish. The aquifer system in the parish has four zones: the shallow zone and zones 1-3. Each zone consists of two to four aquifers ranging in age from Holocene to Miocene.

Wells screened in the shallow zone provide water mainly for irrigation, livestock, and public use. In recent years water levels have shown little change and fluctuate seasonally. Water from the shallow zone is rated predominantly soft and contains sodium bicarbonate.

Most wells screened in the zone 1 aquifers are used for public supply or domestic use. Water levels in these aquifers have slightly declined in the past 9 years. Zone 1 water contains sodium bicarbonate. In zone 2 aquifers, declines in the water level date to the early 1950's. Well yields in zone 2 generally range from 150 to 750 gallons per minute. The Li-149 well, however, yields 1,900 gallons per minute. The water in zone 2, like that in the shallow zone, is rated soft and contains sodium bicarbonate.

Wells screened in the zone 3 aquifers are used mostly for public supply and have yields of about 800 gallons per minute. Water levels have slightly declined during the last few years. Water in this zone contains sodium bicarbonate.

How This Survey Was Made

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

The soils in the survey area occur in an orderly pattern that is related to the geology, the landforms, relief, climate, and the natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of 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, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are 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 are 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 predict with a fairly high degree of accuracy 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 or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are identified 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 soil on the landscape.

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

General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it 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 another 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 potential for major land uses. Table 4 shows the extent of the map units shown on the general soil map. It lists the potential of each, in relation to that of the other map units, for major land uses and shows soil properties that limit use. Soil potential 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, urban uses*, and *recreation uses*. Cultivated crops are those grown extensively in the survey area. Pasture refers to pastures of native and improved grasses for livestock. Woodland refers to areas of native or introduced trees. Urban uses include residential, commercial, and industrial developments. Intensive recreation uses are campsites, picnic areas, ballfields, and other areas that are subject to heavy foot traffic. Extensive recreation areas are those used for nature study and as wilderness.

The boundaries of the general soil map units in Livingston Parish were matched, where possible, with those of the previously completed surveys of Ascension, East Baton Rouge, St. John the Baptist, and Tangipahoa Parishes. In a few places, however, the lines do not join and the names of the map units differ. These differences resulted mainly from changes in soil series concepts, differences in map unit design, and changes in soil patterns near survey area boundaries.

Soil Descriptions

Soils on Uplands

These are mainly level and gently sloping, poorly drained, moderately well drained, and somewhat poorly drained, loamy soils. They are on flats, in depressions, along drainageways, and on ridgetops in the uplands. Slopes range from 0 to 3 percent.

These soils make up about 4 percent of the land area in the parish. Most of the acreage is woodland or pasture. Wetness and flooding are the main problems affecting woodland management and most agricultural uses. Low fertility and the hazard of erosion are additional problems in areas used for pasture. Wetness, slope, slow permeability, and the hazards of flooding and erosion limit most urban uses and intensive recreation uses.

1. Calhoun-Toula-Bude

Level and gently sloping, poorly drained, moderately well drained, and somewhat poorly drained soils that are loamy throughout

The soils in this map unit are on broad flats, along drainageways, in depressions, and on ridgetops. Elevations range from about 45 to 100 feet above sea level. Slopes range from 0 to 3 percent.

This map unit makes up about 4 percent of the land area in the parish. It is about 47 percent Calhoun soils, 20 percent Toula soils, 14 percent Bude soils, and 19 percent soils of minor extent.

The Calhoun soils are level and poorly drained. They are on broad flats, in depressions, and along small drainageways. Typically, the surface layer is dark grayish brown and grayish brown silt loam. The subsurface layer is light brownish gray silt loam. The subsoil is light brownish gray silt loam and silty clay loam.

The Toula soils are gently sloping and moderately well drained. They are on ridgetops. Typically, the surface layer is dark grayish brown silt loam. The subsoil is yellowish brown and strong brown silt loam and silty clay loam in the upper part and a very firm and brittle fragipan of brownish yellow, strong brown, and yellowish brown silt loam in the lower part.

The Bude soils are gently sloping and somewhat poorly drained. They are on ridgetops. Typically, the surface layer is dark grayish brown silt loam. The subsurface layer is light yellowish brown and yellowish brown silt loam. The subsoil is yellowish brown silt loam in the upper part and a fragipan of light brownish gray, yellowish brown, brownish yellow, and light yellowish brown silt loam in the lower part.

Of minor extent in this map unit are the Guyton, Ochlockonee, and Ouachita soils. All of these soils are on flood plains along the major streams.

Most of the acreage in this map unit is used as woodland or pasture. A small acreage is used for cultivated crops.

The Calhoun soils are moderately well suited to woodland, and the Bude and Toula soils are well suited. The main concerns in producing and harvesting timber are soil compaction and the equipment limitation caused by the wetness. Competition from understory plants is an additional concern. In some areas of the Calhoun soils, flooding also is a hazard.

The Toula and Bude soils are well suited to pasture and moderately well suited to crops. The Calhoun soils are moderately well suited to crops and pasture. Low fertility, wetness, potentially toxic levels of exchangeable aluminum, and the hazard of erosion are the main problems affecting these uses. The Calhoun soils that are occasionally flooded are poorly suited to crops.

The soils in this map unit generally are poorly suited to urban uses and most intensive recreation uses. The Toula soils are moderately well suited. Low strength on sites for roads, slow permeability, wetness, and the hazards of flooding and erosion limit most urban and recreation uses.

Soils on Stream or Marine Terraces

These are mainly level and gently sloping, poorly drained and somewhat poorly drained, loamy soils on stream or marine terraces. Slopes range from 0 to 3 percent.

These soils make up about 73 percent of the land area in the parish. Most of the acreage is used as woodland or pasture. A small acreage is used for cultivated crops. Wetness and flooding are the main problems affecting woodland management and most agricultural uses. Low or medium fertility, excess sodium, potentially toxic levels of aluminum, and the hazard of erosion are additional problems in areas used for pasture or cultivated crops. Wetness, low strength on sites for roads, moderately slow or very slow permeability, a moderate or high shrink-swell potential, and the hazards of flooding and erosion limit most urban uses and intensive recreation uses.

2. Abita-Myatt

Gently sloping and level, somewhat poorly drained and poorly drained soils that are loamy throughout

The soils in this map unit are mainly on slightly convex ridges, on side slopes, in broad depressional areas, and along small drainageways on stream or marine terraces. Elevations range from 35 to 90 feet above sea level. Slopes are 0 to 1 percent in the depressional areas and 1 to 3 percent on the ridges.

This map unit makes up about 1 percent of the land area in the parish. It is about 49 percent Abita soils, 34 percent Myatt soils, and 17 percent soils of minor extent.

The Abita soils are gently sloping and somewhat poorly drained. They are on slightly convex ridges and on side slopes along drainageways. Typically, the surface layer is dark grayish brown silt loam. The subsurface layer is pale brown silt loam. The subsoil is yellowish brown and light brownish gray silt loam and silty clay loam.

The Myatt soils are level and poorly drained. They are in depressions and along small drainageways. Typically, the surface layer is dark grayish brown fine sandy loam. The subsurface layer is light brownish gray fine sandy loam. The subsoil is grayish brown loam and gray and light brownish gray sandy clay loam.

Of minor extent in this map unit are the Cahaba, Guyton, Satsuma, and Stough soils. Cahaba soils are on ridges. Guyton soils are on flood plains and in landscape positions similar to those of the Myatt soils. Satsuma and Stough soils are slightly higher on the landscape than the Myatt soils.

Most of the acreage in this map unit is used as woodland or pasture. A small acreage is used for truck crops.

The Abita soils are well suited to woodland, and the Myatt soils are moderately well suited. The main concerns in producing and harvesting timber are soil compaction, the equipment limitation, and the seedling mortality caused by the wetness and flooding. Competition from understory plants is an additional concern.

Most of the soils in this map unit are moderately well suited to crops and well suited to pasture. The Abita soils are well suited to crops. Low fertility, potentially toxic levels of exchangeable aluminum, wetness, and the hazard of erosion are the main limitations. The Myatt soils that are occasionally flooded are poorly suited to crops.

The Abita soils are moderately well suited to urban and intensive recreation uses, and the Myatt soils are poorly suited. Wetness, flooding, low strength on sites for roads, moderately slow or slow permeability, and a moderate shrink-swell potential are the main limitations affecting these uses.

3. Colyell-Springfield-Encrow

Gently sloping and level, somewhat poorly drained and poorly drained soils that have a loamy surface layer and a loamy and clayey subsoil

The soils in this map unit are on broad ridges, on side slopes, in swales, in broad depressional areas, and along small drainageways. Elevations range from 3 to 35 feet above sea level. Slopes range from 0 to 3 percent.

This map unit makes up about 28 percent of the land area in the parish. It is about 30 percent Colyell soils, 25 percent Springfield soils, 21 percent Encrow soils, and 24 percent soils of minor extent.

The Colyell soils are somewhat poorly drained and are level or gently sloping. They are on broad, slightly convex ridges and on side slopes along drainageways. Typically, the surface layer is dark grayish brown silt loam. The subsurface layer is yellowish brown silt loam. The subsoil is mottled and multicolored. It is silty clay in the upper part and silty clay loam in the lower part.

The Springfield soils are level and poorly drained. They are in swales and depressional areas and on broad ridges. Typically, the surface layer is grayish brown silt loam. The subsurface layer is light brownish gray and light gray silt loam. The subsoil is grayish brown silty clay in the upper part and yellowish brown silty clay loam in the lower part.

The Encrow soils are level and poorly drained. They are in depressions and along small drainageways. Typically, the surface layer is grayish brown silt loam. The subsurface layer is light brownish gray silt loam. The next layer is light brownish gray silt loam and gray silty clay loam. The subsoil is dark gray silty clay in the upper part and gray, light brownish gray, and light olive gray silty clay loam in the lower part.

Of minor extent in this map unit are the Deerford, Natalbany, and Verdun soils. Deerford and Verdun soils are slightly higher on the landscape than most of the other soils in this map unit and are somewhat poorly drained. They have high levels of sodium in the subsoil. Natalbany soils are on flood plains.

Most of the acreage in this map unit is used as woodland or pasture. A small acreage is used for cultivated crops or for building site development.

The soils in this map unit generally are moderately well suited to woodland. The Colyell soils that are subject to only rare flooding, however, are well suited. The main concerns in producing and harvesting timber are soil compaction, the equipment limitation, and the seedling mortality caused by wetness and flooding. Competition from understory plants is an additional concern.

These soils generally are poorly suited to urban and intensive recreation uses. The Colyell and Springfield soils that are frequently flooded are generally not suited to these uses because of flooding and the inaccessibility of the individual tracts of land. The Encrow soils are occasionally flooded and thus are generally not suited to homesite development. Flooding, wetness, low strength on sites for roads, slow permeability, and a high shrink-swell potential are the main limitations.

The Colyell and Springfield soils generally are moderately well suited to crops. Colyell soils are well suited to pasture, and Springfield soils are moderately well suited. Wetness, low fertility, potentially toxic levels of exchangeable aluminum, and the hazards of flooding and erosion are the main limitations. The Encrow soils are occasionally flooded and are poorly suited to crops and moderately well suited to pasture. The Colyell and Springfield soils that are frequently flooded generally are not suited to crops and pasture because of the flooding and the inaccessibility of the individual tracts of land.

4. Deerford-Verdun-Gilbert

Level, somewhat poorly drained and poorly drained soils that are loamy throughout and have high levels of sodium in the subsoil

The soils in this map unit are mainly on broad flats, in depressions, and along small drainageways.

Elevations range from 10 to 65 feet above sea level. Slopes are 0 to 1 percent.

This map unit makes up about 5 percent of the land area in the parish. It is about 36 percent Deerford soils, 36 percent Verdun soils, 18 percent Gilbert soils, and 10 percent soils of minor extent.

The Deerford soils are somewhat poorly drained and are on broad flats. They have high levels of sodium in the lower part of the subsoil. Typically, the surface layer is dark grayish brown silt loam. The subsurface layer is brown silt loam. The subsoil is brown and yellowish brown silty clay loam in the upper part and light olive brown silty clay loam and silt loam in the lower part.

The Verdun soils are somewhat poorly drained and are on broad flats. They have high levels of sodium throughout the subsoil. Typically, the surface layer is dark grayish brown silt loam. The subsurface layer is light brownish gray silt loam. The subsoil is grayish brown silty clay loam in the upper part, yellowish brown silty clay loam in the next part, and yellowish brown silt loam in the lower part.

The Gilbert soils are poorly drained. They are on broad flats, in depressions, and along small drainageways. They have high levels of sodium in the lower part of the subsoil. Typically, the surface layer is grayish brown silt loam. The subsurface layer is light brownish gray silt loam. The subsoil is grayish brown and light brownish gray silty clay loam.

Of minor extent in this map unit are the Colyell, Satsuma, and Springfield soils. Colyell and Satsuma soils are somewhat poorly drained and are on low ridges. Springfield soils are in landscape positions similar to those of the Gilbert soils.

The soils in this map unit are used mainly as woodland or pasture. A small acreage is used for truck crops or for homesite development.

The Deerford and Verdun soils are poorly suited to woodland, and the Gilbert soils are moderately well suited. The main concerns in producing and harvesting timber are soil compaction, the equipment limitation, plant competition, and the seedling mortality caused by wetness. High concentrations of sodium in the subsoil limit tree growth.

These soils are poorly suited to crops and poorly suited or moderately well suited to pasture. Low fertility, wetness, and the high levels of sodium are the main limitations. Flooding is a hazard in some areas of the Gilbert soils.

These soils are poorly suited to urban and intensive recreation uses. Wetness, slow or very slow permeability, low strength on sites for roads, the high levels of sodium, and the hazard of flooding are the main management concerns.

5. Gilbert-Satsuma

Level and gently sloping, poorly drained and somewhat poorly drained soils that are loamy throughout

The soils in this map unit are on broad flats, in depressions, along small drainageways, on slightly convex ridges, and on side slopes along drainageways. Elevations range from 10 to 90 feet above sea level. Slopes range from 0 to 3 percent.

This map unit makes up about 21 percent of the land area in the parish. It is about 40 percent Gilbert soils, 39 percent Satsuma soils, and 21 percent soils of minor extent.

The Gilbert soils are level and poorly drained and are on broad flats, in depressions, and along small drainageways. They have high levels of sodium in the lower part of the subsoil. Typically, the surface layer is grayish brown silt loam. The subsurface layer is light brownish gray silt loam. The subsoil is grayish brown and light brownish gray silty clay loam.

The Satsuma soils are gently sloping and somewhat poorly drained. They are on slightly convex ridges and on side slopes along drainageways. Typically, the surface layer is dark grayish brown silt loam. The next layer is light yellowish brown silt loam. Below this is a layer of yellowish brown silty clay loam and light gray silt loam. The subsoil is strong brown silty clay loam in the upper part, yellowish brown clay loam in the next part, and strong brown loam in the lower part.

Of minor extent in this map unit are the Cahaba, Dexter, and Olivier soils. Cahaba and Dexter soils are on ridges. Olivier soils are in landscape positions similar to those of the Satsuma soils.

The soils in this map unit are used mainly as woodland or pasture. A small acreage is used for crops or for homesite development.

The Gilbert soils are moderately well suited to woodland, and the Satsuma soils are well suited. The main concerns in producing and harvesting timber are soil compaction, the equipment limitation, and the seedling mortality caused by wetness and flooding. Competition from understory plants is an additional concern.

The Gilbert soils generally are moderately well suited to crops and pasture, and the Satsuma soils are moderately well suited to crops and are well suited to pasture. Wetness, low fertility, potentially toxic levels of exchangeable aluminum, excess sodium, and the hazard of erosion are the main limitations. The Gilbert soils that are occasionally flooded are poorly suited to crops.

These soils are poorly suited to urban and intensive recreation uses. Wetness, slow or very slow permeability, a moderate shrink-swell potential, low strength on sites for roads, and the hazard of flooding are the main management concerns. The hazard of erosion is an additional concern in areas of the Satsuma soil.

6. Myatt-Satsuma

Level and gently sloping, poorly drained and somewhat poorly drained soils that are loamy throughout

The soils in this map unit are in broad depressional areas, along small drainageways, on broad ridges, and on side slopes along drainageways. Elevations range from 10 to 95 feet above sea level. Slopes range from 0 to 3 percent.

This map unit makes up about 6 percent of the land area in the parish. It is about 65 percent Myatt soils, 30 percent Satsuma soils, and 5 percent soils of minor extent.

The Myatt soils are level and poorly drained. They are in broad depressional areas and along small drainageways. Typically, the surface layer is dark grayish brown fine sandy loam. The subsurface layer is light brownish gray fine sandy loam. The subsoil is grayish brown loam and gray and light brownish gray sandy clay loam.

The Satsuma soils are gently sloping and somewhat poorly drained. They are on broad, slightly convex ridges and on side slopes along drainageways. Typically, the surface layer is dark grayish brown silt loam. The subsurface layer is light yellowish brown silt loam. The subsoil is strong brown and yellowish brown silty clay loam, clay loam, and loam.

Of minor extent in this map unit are the Cahaba, Deerford, Dexter, Olivier, Stough, and Verdun soils. Cahaba and Dexter soils are on ridges and are well drained. Deerford, Olivier, Stough, and Verdun soils are in landscape positions similar to those of the Satsuma soils. Deerford and Verdun soils have high levels of sodium in the subsoil. Part of the subsoil in the Olivier and Stough soils is compact and brittle.

Most of the acreage in this map unit is used as woodland or pasture. A small acreage is used for truck crops, homesites, or extensive recreation areas.

The Myatt soils are moderately well suited to woodland, and the Satsuma soils are well suited. The main concerns in producing and harvesting timber are soil compaction, the equipment limitation, and the seedling mortality caused by wetness. Competition from understory plants also can be a concern. Occasional flooding is a hazard in some areas of the Myatt soils.

The Myatt soils generally are moderately well suited to pasture and crops. The Satsuma soils are well suited to pasture and moderately well suited to crops. Low fertility, potentially toxic levels of exchangeable aluminum, wetness, and the hazard of erosion are the main limitations. Occasional flooding is an additional hazard in some areas of the Myatt soils. The Myatt soils that are occasionally flooded are poorly suited to cultivated crops.

The soils in this map unit generally are poorly suited to urban and intensive recreation uses. Wetness, low strength on sites for roads, moderately slow or slow permeability, a moderate shrink-swell potential, and the hazards of flooding and erosion are the main limitations. The Myatt soils that are occasionally flooded generally are not suited to homesite development.

7. Myatt-Stough

Level, poorly drained and somewhat poorly drained soils that are loamy throughout

The soils in this map unit are in broad depressional areas, along small drainageways, and on ridges. Elevations range from 10 to 90 feet above sea level. Slopes are 0 to 1 percent.

This map unit makes up about 9 percent of the land area in the parish. It is about 64 percent Myatt soils, 18 percent Stough soils, and 18 percent soils of minor extent.

The Myatt soils are in broad depressional areas and along small drainageways. They are poorly drained. Typically, the surface layer is dark grayish brown fine sandy loam. The subsurface layer is light brownish gray fine sandy loam. The subsoil is grayish brown loam and gray and light brownish gray sandy clay loam.

The Stough soils are somewhat poorly drained. They are on broad, slightly convex ridges. Typically, the surface layer is dark grayish brown fine sandy loam. The subsurface layer is light yellowish brown fine sandy loam. The upper part of the subsoil is yellowish brown loam. The next part is yellowish brown clay loam and loam. The lower part is yellowish brown and light brownish gray sandy clay loam and mottled yellowish brown, light yellowish brown, light brownish gray, and strong brown sandy clay loam.

Of minor extent in this map unit are the Cahaba, Guyton, and Satsuma soils. Cahaba soils are on ridges and are well drained. Guyton soils are in landscape positions similar to those of the Myatt soils. They are poorly drained. Satsuma soils are in landscape positions similar to those of the Stough soils. They are somewhat poorly drained.

Most of the acreage in this map unit is used as woodland or pasture. A small acreage is used for truck crops or for homesite development or is developed for intensive recreation uses.

The Myatt soils are moderately well suited to woodland, and the Stough soils are well suited. The main concerns in producing and harvesting timber are soil compaction, the equipment limitation, and the seedling mortality caused by wetness. Competition from understory plants also can be a concern. Occasional flooding is a hazard in some areas of the Myatt soils.

The Myatt soils generally are moderately well suited to pasture and crops. The Stough soils are moderately well suited to crops and well suited to pasture. Low fertility, wetness, flooding, and potentially toxic levels of exchangeable aluminum are the main limitations. The Myatt soils that are occasionally flooded are poorly suited to crops.

The soils in this map unit generally are poorly suited to urban and intensive recreation uses. The Stough soils are moderately well suited to intensive recreation uses. Wetness, moderately slow permeability, low strength on sites for roads, and the hazard of flooding are the main management concerns. Also, the Stough soils can be somewhat droughty. The droughtiness affects lawn grasses and ornamentals in late summer and fall during most years. The Myatt soils that are occasionally flooded are generally not suited to homesite development.

8. Olivier-Gilbert

Gently sloping and level, somewhat poorly drained and poorly drained soils that are loamy throughout

The soils in this map unit are on ridges, on side slopes along drainageways, on broad flats, in depressions, and along small drainageways. Elevations range from 10 to 50 feet above sea level. Slopes range from 0 to 3 percent.

This map unit makes up about 3 percent of the land area in the parish. It is about 60 percent Olivier soils, 30 percent Gilbert soils, and 10 percent soils of minor extent.

The Olivier soils are level or gently sloping and are somewhat poorly drained. They are on ridges and on side slopes along drainageways. Typically, the surface layer is dark brown silt loam. The subsurface layer is light yellowish brown silt loam. The upper part of the subsoil is yellowish brown silt loam. The lower part is a fragipan of yellowish brown silty clay loam.

The Gilbert soils are level and poorly drained and are on broad flats, in depressions, and along small drainageways. They have high levels of sodium in the lower part of the subsoil. Typically, the surface layer is grayish brown silt loam. The subsurface layer is light brownish gray silt loam. The subsoil is grayish brown and light brownish gray silty clay loam.

Of minor extent in this map unit are the Brimstone, Deerford, Satsuma, and Verdun soils. Brimstone soils are in landscape positions similar to those of the Gilbert soils. They have high levels of sodium in the lower part of the subsoil. Satsuma soils are in landscape positions similar to those of the Olivier soil. They do not have a fragipan or high levels of sodium in the subsoil.

Most of the acreage in this map unit is used as pasture or woodland. A small acreage is used for truck crops or for homesite development.

The Olivier soils are well suited to woodland, and the Gilbert soils are moderately well suited. The main concerns in producing and harvesting timber are soil compaction, the equipment limitation, and the seedling mortality caused by wetness. Competition from understory plants also can be a concern. Flooding is a hazard in some areas of the Gilbert soils.

The Olivier soils are well suited to pasture and moderately well suited to crops. The Gilbert soils generally are moderately well suited to pasture and crops. Low fertility, wetness, and the hazard of erosion are the main limitations. The Gilbert soils that are occasionally flooded are poorly suited to cultivated crops.

The Olivier soils are poorly suited to urban uses and moderately well suited to intensive recreation uses. The Gilbert soils generally are poorly suited to these uses. The occasionally flooded Gilbert soils are generally not suited to homesite development. Wetness, slow or very slow permeability, a moderate shrink-swell potential, low strength on sites for roads, and the hazard of flooding are the main management concerns. The hazard of erosion also is a concern in gently sloping areas of the Olivier soils.

Soils on Flood Plains

These are mainly gently sloping and level, well drained and poorly drained, loamy, frequently flooded soils on flood plains. Slopes range from 0 to 3 percent.

These soils make up about 9 percent of the land area in the parish. Most of the acreage is used as woodland. A small acreage is used for pasture. Wetness and the hazard of flooding are the main management concerns. Low fertility also is a limitation in pastured areas.

9. Ouachita-Ochlockonee-Guyton

Gently sloping and level, well drained and poorly drained soils that have a loamy surface layer and subsoil and loamy and sandy underlying material

The soils in this map unit are on flood plains along streams. They are frequently flooded. Elevations range from about 5 to 80 feet above sea level. Slopes range from 0 to 3 percent.

This map unit makes up about 9 percent of the land area in the parish. It is about 35 percent Ouachita soils, 30 percent Ochlockonee soils, 20 percent Guyton soils, and 15 percent soils of minor extent.

The Ouachita soils are gently sloping and well drained. They are on low ridges. Typically, the surface layer is brown silt loam. The subsoil is yellowish brown and dark yellowish brown silt loam and silty clay loam.

The Ochlockonee soils are gently sloping and well drained. They are on low ridges. Typically, the surface layer is brown sandy loam. The underlying material is yellowish brown sandy loam and loamy sand.

The Guyton soils are level and poorly drained. They are in low areas between the ridges. Typically, the surface layer is dark grayish brown silt loam. The subsurface layer is grayish brown and light brownish gray silt loam. The subsoil is mottled silty clay loam. It is grayish brown in the upper part and gray in the lower part.

Of minor extent in this map unit are the Cahaba soils and soils that are similar to the Guyton soils but contain more sand throughout. Cahaba soils are on ridges on stream terraces. They are well drained.

Most of the acreage in this map unit is used as woodland. A small acreage is used as pasture or recreation areas.

The soils in this map unit are moderately well suited to woodland. The main concerns in producing and harvesting timber are seedling mortality and the equipment limitation caused by wetness and flooding. The soils are poorly suited to pasture and generally are unsuited to cultivated crops. Wetness, low fertility, and the hazard of flooding are the main management concerns. Because of the wetness and flooding, the soils generally are not suited to urban or intensive recreation uses. They are well suited to habitat for deer, squirrels, rabbits, ducks, turkeys, and numerous other small birds and animals.

Soils in Swamps

These are mainly level, very poorly drained, very fluid, clayey and mucky soils in swamps. These soils are ponded most of the time.

These soils make up about 14 percent of the land area in the parish. Most of the acreage supports native vegetation and is used as extensive recreation areas or as habitat for wetland wildlife. The soils generally are not suited to cropland, pasture, urban uses, or intensive recreation uses.

10. Barbary

Level, very poorly drained soils that have a mucky surface layer and very fluid, clayey underlying material

The soils in this map unit are in swamps that are ponded most of the time. Elevations range from 1.0 to about 2.5 feet above sea level. Slopes are less than 1 percent.

This map unit makes up about 10 percent of the land area in the parish. It is about 90 percent Barbary soils and 10 percent soils of minor extent.

Typically, the Barbary soils have a surface layer of very dark grayish brown muck. The underlying material is gray, very fluid clay.

Of minor extent in this map unit are the Colyell, Maurepas, and Springfield soils. Colyell and Springfield soils are on islands within the swamps and around the edges of the swamps. They are firm, mineral soils. Maurepas soils are in landscape positions similar to those of the Barbary soils. They are very fluid and mucky throughout.

Most of the acreage in this map unit supports native trees and aquatic vegetation. It is used as recreation areas and as habitat for wetland wildlife. The soils provide habitat for waterfowl, furbearers, alligators, swamp rabbits, and nongame birds. They are part of an estuary that contributes to the support of marine fishes and crustaceans. Hunting and other outdoor activities are popular in areas of this map unit.

Because of ponding and low strength, these soils are not suited to crops, pasture, urban uses, or intensive recreation uses. They are poorly suited to woodland. Seedling mortality is severe, and special harvesting equipment is needed because of low strength. If the soils are drained, a medium subsidence potential and a very high shrink-swell potential are severe limitations affecting urban and intensive recreation uses.

11. Maurepas

Level, very poorly drained soils that are mucky throughout

The soils in this map unit are in swamps. They are ponded most of the time. Elevations range from sea level to about 1 foot above sea level. Slopes are less than 1 percent.

This map unit makes up about 4 percent of the land area in the parish. It is about 90 percent Maurepas soils and 10 percent soils of minor extent.

Typically, the Maurepas soils have a surface layer of very dark grayish brown muck. Below this is dark yellowish brown and very dark grayish brown muck.

Of minor extent in this map unit are the Barbary soils. These soils are very poorly drained. They are in landscape positions similar to those of the Maurepas soils. They generally are very fluid and clayey throughout.

Most of the acreage in this map unit supports native trees and aquatic vegetation. It is used as recreation areas and as habitat for wetland wildlife. The soils provide habitat for waterfowl, furbearers, alligators, swamp rabbits, and nongame birds. They are part of an estuary that contributes to the support of marine fishes and crustaceans. Hunting and outdoor activities are popular in areas of this map unit.

Because of ponding, subsidence, and low strength, these soils generally are not suited to crops, pasture, woodland, or urban uses. If the soils are drained, they can subside as much as several feet below sea level.

Detailed Soil Map Units

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

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

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

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

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

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

A *soil complex* consists of two or more soils, or one or more soils and a miscellaneous area, 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. Gilbert-Brimstone silt loams, occasionally flooded, 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 the mapped areas 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. Ouachita, Ochlockonee, and Guyton 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.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. The pits in Pits-Arents complex, 0 to 5 percent slopes, is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

The boundaries of map units in Livingston Parish were matched, where possible, with those of the previously completed survey of Ascension, East Baton Rouge, St. John the Baptist, and Tangipahoa Parishes. In a few places, however, the lines do not join and the names of the map units differ. These differences resulted mainly from changes in soil series concepts, differences in map unit design, and changes in soil patterns near survey area boundaries.

All of the soils in Livingston Parish were mapped at the same level of detail, except for those soils in swamps and those soils on bottom land that are subject to frequent flooding or ponding. In areas where flooding and ponding limit the use and management of the soils, separating soils in mapping is of little importance to the land user.

Table 5 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of

Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

Soil Descriptions

Ab—Abita silt loam, 1 to 3 percent slopes. This soil is gently sloping and somewhat poorly drained. It is on ridges and side slopes along drainageways on stream or marine terraces. Areas range from about 30 to 200 acres in size.

Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The subsurface layer is pale brown silt loam about 5 inches thick. The upper part of the subsoil is yellowish brown and light brownish gray silt loam. The next part is yellowish brown, mottled silty clay loam. The lower part to a depth of about 60 inches is light brownish gray, mottled silty clay loam.

Included with this soil in mapping are a few small areas of Cahaba, Guyton, Myatt, and Satsuma soils. Cahaba soils are well drained and are on ridges. They have a subsoil that is reddish in the upper part. Guyton and Myatt soils are poorly drained and are on the flood plains along drainageways. They are grayish throughout. Satsuma soils are in landscape positions similar to those of the Abita soil. The part of their subsoil in which clay has accumulated is not so thick as that of the Abita soil. Included soils make up about 10 percent of the map unit.

The Abita soil is characterized by low fertility and high levels of exchangeable aluminum that are potentially toxic to most crops. Water and air move through the upper part of the subsoil at a moderately slow 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 at a depth of about 1.5 to 3.0 feet from December to April. The shrink-swell potential is low in the upper part of the subsoil and moderate in the lower part.

In most areas this soil is used as woodland or pasture. A few areas are used for crops or for urban or recreational development.

This soil is well suited to loblolly pine, slash pine, and sweetgum. The main concerns in producing and harvesting timber are soil compaction and a moderate equipment limitation caused by wetness. Plant competition also is a concern. After the trees are harvested, carefully managed reforestation can control competition from undesirable understory plants. Competing vegetation also can be controlled by proper site preparation and by spraying, cutting, or girdling, which can eliminate unwanted weeds, brush, or trees. Using low-pressure ground equipment can keep the formation of ruts and soil compaction to a minimum.

This soil is well suited to pasture. Suitable pasture plants are bahiagrass, common bermudagrass, white clover, southern winterpeas, vetch, tall fescue, and ryegrass. Erosion is a moderate hazard until the plants are established. A seedbed should be prepared on the contour or across the slope if possible. Wetness can limit the period of grazing in some years. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Fertilizer and lime are needed if the optimum growth of grasses and legumes is to be achieved.

This soil is moderately well suited to cultivated crops, mainly vegetables. The main limitations are a moderate hazard of erosion, low fertility, and potentially toxic levels of exchangeable aluminum within the root zone. The soil is friable and can be easily kept in good tilth. It can be worked throughout a wide range in moisture content. A seedbed should be prepared on the contour or across the slope if possible. Runoff and erosion can be controlled by plowing in the fall, by applying fertilizer, and by seeding a cover crop. Crops respond well to applications of lime and fertilizer, which overcome the low fertility and high levels of exchangeable aluminum.

This soil is moderately well suited to urban development. The main limitations are the wetness, the moderately slow or slow permeability, low strength on sites for roads, and the moderate shrink-swell potential. Also, the hazard of erosion is moderate. The soil has moderate or severe limitations as a building site and severe limitations as a site for local roads and streets and most sanitary facilities. The moderately slow or slow permeability and the high water table increase the possibility that septic tank systems will fail. Sewage lagoons or self-contained disposal units can be used to dispose of sewage properly. The design of roads and streets can offset the limited traffic-supporting capacity. Constructing buildings on earthen mounds increases the depth to the water table. Strengthening the foundations of buildings helps to prevent the structural damage caused by shrinking and swelling of the subsoil. A drainage system is needed in areas used for most lawn grasses, shade trees, ornamental trees, shrubs, vines, and vegetable gardens. Revegetating disturbed areas around construction sites as soon as possible helps to control erosion.

This soil is moderately well suited to recreational development. The main management concerns are the wetness, the moderately slow or slow permeability, and a moderate hazard of erosion. A drainage system is needed in most recreation areas. Erosion and sedimentation can be controlled by maintaining an adequate plant cover. The plant cover can be maintained by controlling traffic and applying fertilizer.

This soil is well suited to habitat for ducks, deer, rabbit, quail, turkey, dove, and numerous small furbearers. The habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by propagating the natural plants.

The capability subclass is IIe. The woodland ordination symbol is 11W.

At—Aquents, dredged. These soils formed in spoil material dredged from nearby swamps during the construction and maintenance of waterways. The soils are level or gently sloping and are poorly drained. They are subject to rare flooding. The flooding occurs less often than once in 10 years during any part of the year. Slopes range from 0 to 5 percent.

These soils are stratified throughout with mucky, clayey, loamy, and sandy layers. Typically, the soils are firm in the upper part and slightly fluid or very fluid in the lower part. The surface layer is very strongly acid to moderately alkaline.

Included with these soils in mapping are a few small areas of Barbary and Maurepas soils. These included soils are in areas that have not been covered by fill material. They make up about 10 percent of the map unit.

The Aquents have a seasonal high water table near the surface during wet periods. Permeability is slow. The soils have low strength. The total subsidence potential is low or medium.

Most areas are used as woodland or as campsites. Extensive recreation uses are common in areas of these soils.

These soils have severe limitations as sites for urban uses. The wetness, the flooding, the slow permeability, low strength, and the subsidence potential are the main limitations.

These soils are poorly suited to crops and pasture because of the wetness and inaccessibility. They are well suited to habitat for wetland wildlife. The habitat can be improved by constructing shallow ponds for use by waterfowl and furbearers, such as muskrat, raccoon, otter, and nutria. Food and roosting areas are available for ducks, geese, and other waterfowl. The soils also provide habitat for alligators and furbearers, such as mink, otter, raccoon, and muskrat.

The capability subclass is IIIw. No woodland ordination symbol is assigned.

BA—Barbary muck. This soil is level and very poorly drained. It is a very fluid, mineral soil in swamps. It is ponded most of the time. Areas range from about 100 to several thousand acres in size. Slopes are less than 1 percent. The number of observations made in these areas was fewer than the number in most other areas of the parish. The detail of mapping, however, is adequate for the expected use of the soil.

Typically, the surface layer is very dark grayish brown muck about 6 inches thick. The underlying material to a depth of about 65 inches is gray, very fluid clay. It is mottled in the upper part.

Included with this soil in mapping are a few areas of Maurepas soils. These soils are in landscape positions similar to those of the Barbary soil. They are muck throughout. They make up about 15 percent of the map unit.

The Barbary soil has a water table that fluctuates between 0.5 foot below and 1.0 foot above the surface. It has low strength. Permeability is very slow. The total subsidence potential is medium. The shrink-swell potential generally is low. It is very high, however, if the soil is drained.

Most of the acreage supports native vegetation. It is used as habitat for wetland wildlife and as extensive recreation areas, such as hunting grounds.

This soil is poorly suited to woodland. Wetness and poor trafficability are the main limitations. Seedling mortality is severe because of the wetness. Few areas are used as commercial woodland because trees grow slowly and special harvesting equipment is needed. The soil is too soft and boggy to support the weight of most types of harvesting equipment.

The natural vegetation on this soil consists of water-tolerant trees and aquatic understory plants. The main trees are baldcypress, water tupelo, and black willow. The understory and aquatic vegetation consists mainly of alligatorweed, buttonbush, bulltongue, duckweed, pickerelweed, and water hyacinth.

This soil is well suited to habitat for wetland wildlife. It provides habitat for turkey, crawfish, ducks, squirrels, alligators, wading birds, and furbearers, such as raccoon, mink, and otter. White-tailed deer and swamp rabbits frequent areas of this soil during periods when the soil is dry or is not covered by deep water. Trapping of alligators and furbearers is an important enterprise. Constructing shallow ponds can improve the habitat for waterfowl.

This soil is not suited to pasture or cropland. It is too wet for these uses. Generally, it is too soft and boggy for grazing by livestock.

This soil is not suited to recreational or urban uses.

The wetness, the hazard of flooding, low strength, and the potential for subsidence are too severe for these uses. Also, excavation is difficult because of buried stumps and logs. The soil can be drained and protected from flooding, but only by levees and water pumps. After the soil is drained, the shrink-swell potential is very high. This is a severe limitation on sites for dwellings. Specially designing building foundations helps to prevent the structural damage caused by shrinking and swelling.

The capability subclass is VIIw. The woodland ordination symbol is 4W.

Bd—Bude silt loam, 1 to 3 percent slopes. This soil is gently sloping and somewhat poorly drained. It is on slightly convex ridgetops in the uplands. Areas range from about 20 to 200 acres in size.

Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The subsurface layer extends to a depth of 15 inches. It is light yellowish brown and yellowish brown, mottled silt loam. The upper part of the subsoil is yellowish brown, mottled silt loam about 3 inches thick. The lower part to a depth of about 60 inches is a fragipan of light brownish gray and yellowish brown, mottled silt loam and yellowish brown, brownish yellow, and light yellowish brown, mottled silt loam.

Included with this soil in mapping are a few small areas of Calhoun and Toula soils. Calhoun soils are poorly drained and are in slightly depressional areas and along drainageways. They are grayish throughout. Toula soils are moderately well drained and are higher on the landscape than the Bude soil. They do not have gray mottles in the upper part of the subsoil. Included soils make up about 10 percent of the map unit.

The Bude soil is characterized by low fertility and high levels of exchangeable aluminum that are potentially toxic to most crops. Water and air move through the fragipan at a slow rate. Water runs off the surface at a slow or medium rate. A water table is perched on the fragipan. It is at a depth of about 0.5 foot to 1.5 feet from January through April. The soil dries quickly after heavy rains. The effective rooting depth is limited by the fragipan. Plants are damaged by a shortage of water during dry periods in the summer and fall of most years. The shrink-swell potential is moderate.

Most of the acreage of this soil is used as woodland or pasture. A small acreage is used for crops, building site development, or recreational development.

This soil is well suited to loblolly pine and slash pine. The main concerns in producing and harvesting timber are competition from understory plants and a moderate equipment limitation caused by wetness. When the soil is moist, the use of logging equipment can result in the formation of ruts and in compaction. After the trees are harvested, carefully managed reforestation can control competition from undesirable understory plants. Competing vegetation also can be controlled by proper site preparation and by spraying, cutting, or girdling, which can eliminate unwanted weeds, brush, or trees. Conventional methods of harvesting timber cannot be used during rainy periods, generally from January to April.

This soil is well suited to pasture. The main management concerns are low fertility and the hazard of erosion. Suitable pasture plants are bahiagrass, common bermudagrass, improved bermudagrass, white clover, southern winterpeas, vetch, tall fescue, and ryegrass. A seedbed should be prepared on the contour or across the slope if possible. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Fertilizer and lime are needed if the optimum growth of grasses and legumes is to be achieved.

This soil is moderately well suited to cultivated crops, mainly vegetables, corn, and grain sorghum. The main management concerns are a moderate hazard of erosion, low fertility, and potentially toxic levels of exchangeable aluminum within the root zone. The soil is friable and can be easily kept in good tilth. It can be worked throughout a wide range in moisture content. A seedbed should be prepared on the contour or across the slope if possible. Runoff and erosion can be controlled by returning all crop residue to the soil or by seeding a cover crop in the fall. Crops respond well to applications of lime and fertilizer, which help to overcome the low fertility and high levels of exchangeable aluminum.

Mainly because of the wetness, the slow permeability, and low strength on sites for roads, this soil is poorly suited to urban development. The hazard of erosion is moderate. The soil has severe limitations as a site for buildings, local roads and streets, and most sanitary facilities. Excess water can be removed by shallow ditches. It also can be removed by providing the proper grade for drainage. The design of roads can offset the limited traffic-supporting capacity. The slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. Lagoons or self-contained sewage disposal units are suitable systems of waste disposal. A drainage system is needed in areas used for most lawn grasses, shade trees, ornamental trees, shrubs, vines, and vegetable gardens. Revegetating disturbed areas around construction sites as soon as possible helps to control erosion.

Mainly because of the wetness, this soil is poorly suited to recreational development. Erosion can be a concern in areas where the surface is disturbed. A good drainage system is needed in most recreation areas. Maintaining the plant cover helps to control runoff and erosion.

This soil is well suited to habitat for deer, rabbit, quail, turkey, dove, and numerous nongame birds. The habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by propagating desirable plants.

The capability subclass is IIe. The woodland ordination symbol is 10W.

Ca—Cahaba fine sandy loam, 1 to 3 percent slopes. This soil is gently sloping and well drained. It is on slightly convex ridges on terraces along the major streams. Areas range from about 5 to 100 acres in size.

Typically, the surface layer is brown fine sandy loam about 5 inches thick. The subsoil is about 48 inches thick. It is red and yellowish red sandy clay loam in the upper part and strong brown sandy loam in the lower part. The underlying material to a depth of about 60 inches is strong brown loamy sand.

Included with this soil in mapping are a few small areas of Dexter, Gilbert, Guyton, Myatt, and Satsuma soils. Dexter soils are in landscape positions similar to those of the Cahaba soil. They contain more silt and less sand in the subsoil than the Cahaba soil. Gilbert, Guyton, and Myatt soils are in depressions and are poorly drained. They are grayish throughout. Satsuma soils are slightly lower on the landscape than the Cahaba soil and are somewhat poorly drained. They have a brownish, mottled subsoil. Also included are a few small areas of Cahaba soils that are subject to rare flooding. Included soils make up about 10 percent of the map unit.

The Cahaba soil is characterized by low fertility and high levels of exchangeable aluminum that are potentially toxic to most crops. Water and air move through this soil at a moderate rate, and water runs off the surface at a medium rate. Plants generally are adversely affected by a shortage of water during dry periods in the summer and fall of most years. The soil dries quickly after rains.

Most of the acreage of this soil is used as pasture or woodland. A small acreage is used for cultivated crops or for building site development. In places the underlying sand and gravel are mined for road or building construction material.

This soil is well suited to pasture. Few limitations affect pastured areas. Suitable pasture plants are common bermudagrass, bermudagrass, bahiagrass, ball clover, and crimson clover. Proper stocking rates and pasture rotation help to keep the pasture in good condition. Fertilizer and lime are needed if the optimum growth of grasses and legumes is to be achieved.

This soil is well suited to loblolly pine and slash pine. Few limitations affect the production of timber. After the trees are harvested, carefully managed reforestation helps to control competition from undesirable understory plants. Conventional methods of harvesting timber generally can be used throughout the year.

This soil is moderately well suited to cultivated crops, mainly corn, grain sorghum, and vegetables. The main management concerns are the hazard of erosion, low fertility, and potentially toxic levels of exchangeable aluminum within the root zone. The soil is friable and can be easily kept in good tilth. It can be worked throughout a wide range in moisture content. Crops are damaged by a shortage of moisture during dry periods in some years. Irrigation can prevent crop damage during these periods in areas where a suitable water supply is available. Returning all crop residue to the soil and including grasses, legumes, or a grass-legume mixture in the cropping sequence help to maintain fertility and tilth. Contour farming and stripcropping can help to control erosion. Most crops respond well to applications of fertilizer and lime, which help to overcome the low fertility and high content of exchangeable aluminum.

This soil is well suited to homesite development and other urban uses. Few limitations affect these uses. As many trees as possible should be preserved on the building site. Mulching, applying fertilizer, and irrigating help to establish lawn grasses and other small-seeded plants. Seepage is a problem if the soil is used for sewage lagoons. Sand and gravel are available in areas of this soil, but an excessive content of silt and clay is a problem in places.

This soil is well suited to recreational development. Erosion can be a problem in areas where the plant cover is not adequate. Maintaining the plant cover can help to control runoff and erosion.

This soil is well suited to habitat for rabbits, quail, doves, deer, turkeys, and numerous nongame birds. The habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by propagating desirable plants.

The capability subclass is IIe. The woodland ordination symbol is 9A.

Ch—Calhoun silt loam. This soil is level and poorly drained. It is on broad flats and in slightly depressional areas in the uplands. The soil is subject to rare flooding, which occurs for brief to long periods, mainly in winter and spring. Areas are irregular in shape and 10 to 200 acres in size. Slopes are less than 1 percent.

Typically, the surface layer is dark grayish brown silt loam about 3 inches thick. The subsurface layer is light brownish gray, mottled silt loam about 15 inches thick. The subsoil to a depth of about 60 inches is light brownish gray, mottled silt loam and silty clay loam.

Included with this soil in mapping are a few small areas of Bude and Toula soils. These soils are higher on the landscape than the Calhoun soil. They have a fragipan. They make up about 10 percent of the map unit.

The Calhoun soil is characterized by low fertility and high levels of exchangeable aluminum 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 and stands in low areas for short periods after heavy rains. A seasonal high water table is within a depth of 1.5 feet from December through April. The shrink-swell potential is moderate.

Most of the acreage of this soil is used as woodland or pasture. A small acreage is used for vegetables or for urban or recreational development.

This soil is moderately well suited to loblolly pine and slash pine. The main concerns in producing and harvesting timber are soil compaction, a moderate equipment limitation, and moderate seedling mortality caused by wetness. Plant competition also is a concern. After the trees are harvested, carefully managing reforestation helps to control competition from undesirable understory plants. Planting and harvesting during dry periods can minimize the formation of ruts and soil compaction. Conventional methods of harvesting timber cannot be used during rainy periods, mainly from December to April.

This soil is moderately well suited to pasture. The main limitations are wetness and low fertility. The main suitable pasture plants are common bermudagrass, bahiagrass, white clover, and southern winterpeas. Excess surface water can be removed by field ditches and suitable outlets. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Fertilizer and lime are needed if the optimum growth of grasses and legumes is to be achieved.

This soil is moderately well suited to crops, mainly vegetables. The main management concerns are wetness, low fertility, and potentially toxic levels of exchangeable aluminum within the root zone. The soil is friable and can be easily kept in good tilth, but a surface crust can form during dry periods. Proper row arrangement, field ditches, and suitable outlets help to remove excess surface water. Returning all crop residue to the soil and including grasses, legumes, or a grass-legume mixture in the cropping sequence help to maintain fertility, the organic matter content, and tilth. Crops respond well to applications of lime and fertilizer, which help to overcome the low fertility and high content of exchangeable aluminum.

Mainly because of the wetness, the flooding, the slow permeability, and low strength on sites for roads, this soil is poorly suited to urban development. It has severe limitations as a site for buildings, local roads and streets, and most sanitary facilities. Excess water can be removed by shallow ditches. It also can be removed by providing the proper grade for drainage. The soil can be protected against flooding by dikes or levees. Selection of adapted vegetation for planting is critical in areas used for lawns, shrubs, trees, and vegetable gardens. The design of local roads and streets can offset the limited traffic-supporting capacity. The slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. If flooding is controlled, lagoons or self-contained sewage disposal units can be used to dispose of sewage properly.

Mainly because of the wetness, this soil is poorly suited to recreational development. A good drainage system and flood-control measures are needed in intensively used areas, such as playgrounds and campsites. The plant cover can be maintained by controlling traffic and applying fertilizer.

This soil is well suited to habitat for ducks, deer, rabbits, quail, turkeys, doves, and small furbearers. The habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by propagating desirable plants.

The capability subclass is IIIw. The woodland ordination symbol is 9W.

Cn—Calhoun silt loam, occasionally flooded. This soil is level and poorly drained. It is in broad depressional areas and along small drainageways in the uplands. It is occasionally flooded, mainly in winter and spring. Areas are irregular in shape and 20 to several hundred acres in size. Slopes are less than 1 percent.

Typically, the surface layer is grayish brown silt loam about 4 inches thick. The subsurface layer is light brownish gray, mottled silt loam about 11 inches thick. The upper part of the subsoil is mixed gray and light brownish gray, mottled silt loam. The lower part to a depth of about 60 inches is light brownish gray, mottled silty clay loam.

Included with this soil in mapping are a few small areas of Bude and Toula soils. These soils have a fragipan. They are higher on the landscape than the Calhoun soil. Bude soils are somewhat poorly drained, and Toula soils are moderately well drained. Included soils make up about 10 percent of the map unit.

The Calhoun soil is characterized by low fertility and high levels of exchangeable aluminum 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 and stands in low areas for long periods. A seasonal high water table is within a depth of 2 feet from December through April. The soil dries slowly after heavy rains.

Most areas are used as woodland or pasture. A small acreage is used as cropland or for urban or recreational development.

This soil is moderately well suited to loblolly pine and slash pine. The main concerns in producing and harvesting timber are soil compaction, a severe equipment limitation, and moderate seedling mortality caused by flooding and wetness. Plant competition also is a concern. After the trees are harvested, carefully managed reforestation helps to control competition from undesirable understory plants. Planting and harvesting during dry periods can minimize the formation of ruts and soil compaction. Conventional methods of harvesting timber cannot be used during rainy periods, mainly from December to April.

This soil is moderately well suited to pasture. The main management concerns are low fertility and the hazard of flooding. Suitable pasture plants are common bermudagrass, bahiagrass, white clover, and southern winterpeas. Wetness limits the choice of plants and the period of grazing. Excess surface water can be removed by field ditches and suitable outlets. Flooding can be controlled only by levees and water pumps. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Fertilizer and lime are needed if the optimum growth of grasses and legumes is to be achieved.

This soil is poorly suited to crops, although vegetables are grown in some areas. The main management concerns are the hazard of flooding, wetness, low fertility, and potentially toxic levels of exchangeable aluminum within the root zone. The soil is friable and can be easily kept in good tilth; however, the surface tends to crust during dry periods. Flooding can be controlled, but only by major flood-control structures, such as levees. Proper row arrangement, field ditches, and vegetated outlets are needed to remove excess surface water. Returning all crop residue to the soil and including grasses, legumes, or a grass-legume mixture in the cropping sequence help to maintain fertility and tilth. Crops respond well to applications of lime and fertilizer, which help to overcome the low fertility and high levels of exchangeable aluminum.

This soil is poorly suited to urban development. It generally is not suited to homesite development unless it is protected from flooding. The main limitations are the wetness, the slow permeability, low strength on sites for roads, and the hazard of flooding. A drainage system and flood control are needed if roads and building foundations are constructed. Excess water can be removed by shallow ditches. It also can be removed by providing the proper grade for drainage. Roads and streets can be built above the level of flooding. Properly designing the roads and streets helps to offset the limited traffic-supporting capacity. Selection of adapted vegetation for planting is critical in areas used for lawns, shrubs, trees, and vegetable gardens. The slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. If flooding is controlled, lagoons and self-contained disposal units can be used to dispose of sewage properly.

Mainly because of the flooding and the wetness, this soil is poorly suited to recreational uses. A good drainage system is needed in most recreation areas. The plant cover can be maintained by controlling traffic.

This soil provides habitat for ducks, deer, rabbits, quail, turkeys, doves, and numerous small furbearers. The habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by propagating desirable plants.

The capability subclass is IVw. The woodland ordination symbol is 9W.

Co—Colyell silt loam, 1 to 3 percent slopes. This soil is gently sloping and somewhat poorly drained. It is on broad, slightly convex ridges and on side slopes along drainageways on stream or marine terraces. The soil is subject to rare flooding, which occurs mainly in winter and spring. Areas are irregular in shape and range from 10 to 300 acres in size.

Typically, the surface layer is dark grayish brown silt loam about 3 inches thick. The subsurface layer is yellowish brown, mottled silt about 5 inches thick. The next layer is yellowish brown, mottled silt loam about 4 inches thick. The upper part of the subsoil is mottled light brownish gray, yellowish brown, and yellowish red silty clay and silt loam. The next part is yellowish brown, mottled silty clay loam. The lower part to a depth of about 60 inches is light olive brown, mottled silty clay loam.

Included with this soil in mapping are a few small areas of Deerford, Encrow, Natalbany, Springfield, and Verdun soils. Deerford and Verdun soils are slightly higher on the landscape than the Colyell soil. They have high levels of sodium salts in the subsoil. The poorly drained Encrow and Springfield soils are on broad flats and in depressions. Encrow soils are grayish throughout. Springfield soils are characterized by an abrupt change in texture between the subsurface layer and the subsoil. Natalbany soils are on flood plains. They are grayish throughout. Included soils make up about 10 percent of the map unit.

The Colyell soil is characterized by low fertility and moderately high levels of exchangeable aluminum that are potentially toxic to some crops. Permeability is slow. Plants can be adversely affected by a shortage of water during dry periods in the summer and fall of some years. The concentrations of sodium in the lower part of the subsoil restrict root development and limit the amount of water available to plants. Water runs off the surface at a medium rate. The soil has a perched water table about 1.5 to 3.0 feet below the surface from December through April. The shrink-swell potential is high in the subsoil.

Most areas of this soil are used as woodland or pasture. A few areas are used as cropland, homesites, or extensive recreation areas, such as hunting grounds.

This soil is well suited to loblolly pine and slash pine. The main limitations in producing and harvesting timber are a moderate equipment limitation caused by wetness. Competition from understory plants also is a concern. Conventional methods of harvesting timber cannot be used during rainy periods, mainly from December to April. Using standard wheeled and tracked equipment when the soil is moist causes the formation of ruts and compaction. Puddling can occur when the soil is wet. Using low-pressure ground equipment minimizes damage to the soil and helps to maintain productivity. After the trees are harvested, carefully managed reforestation can control competition from undesirable understory plants. Competing vegetation also can be controlled by proper site preparation and by spraying, cutting, or girdling, which can eliminate unwanted weeds, brush, or trees.

This soil is well suited to pasture. The main limitations are the hazard of erosion, low fertility, and wetness. Suitable pasture plants are bahiagrass, improved bermudagrass, common bermudagrass, white clover, southern winterpeas, vetch, tall fescue, and ryegrass. Grazing when the soil is wet causes puddling and compaction, which reduce forage production. A seedbed should be prepared on the contour or across the slope if possible. Fertilizer and lime are needed if the optimum production of forage is to be achieved. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

This soil is moderately well suited to cropland. The main limitation is the hazard of erosion. Low fertility, potentially toxic levels of exchangeable aluminum, and wetness are additional limitations. The soil is friable and can be easily kept in good tilth. It can be worked throughout a wide range in moisture content. Excessive cultivation can result in the formation of a tillage pan. This pan can be broken by subsoiling when the soil is dry. Minimizing tillage and returning all crop residue to the soil or regularly adding other organic material improve fertility and help to maintain tilth and the content of organic matter. Proper row arrangement, field ditches, and vegetated outlets help to remove excess surface water. Most crops respond well to applications of fertilizer and lime, which improve fertility and reduce the levels of exchangeable aluminum within the root zone. The hazard of erosion can be reduced if fall grain or winter pasture grasses are seeded early and tillage and seeding are on the contour or across the slope. Also, waterways should be shaped and seeded to perennial grasses.

Mainly because of the wetness, the slow permeability, low strength on sites for roads, the high shrink-swell potential, and the hazard of flooding, this soil is poorly suited to urban development. It has severe limitations as a site for buildings, local roads and streets, and most sanitary facilities. Excess water can be removed by shallow ditches. It also can be removed by providing the proper grade for drainage. The hazard of erosion is increased if the surface is exposed during site development. Revegetating disturbed areas around construction sites as soon as possible helps to control erosion. The design of local roads and streets can offset the limited traffic-supporting capacity. The slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. If flooding is controlled, lagoons or self-contained disposal units can be used to dispose of sewage properly. Properly designing the foundations and footings of buildings and diverting runoff away from the buildings help to prevent the structural damage caused by shrinking and swelling.

Mainly because of the wetness, the slow permeability, and the hazard of flooding, this soil is poorly suited to recreational development. A good drainage system is needed in intensively used areas, such as playgrounds and camp sites. Erosion and sedimentation can be controlled and the beauty of the area enhanced by maintaining an adequate plant cover.

This soil is well suited to habitat for deer, rabbits, quail, turkeys, doves, and numerous nongame birds. The habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by propagating desirable plants.

The capability subclass is IIe. The woodland ordination symbol is 13W.

Cy—Colyell-Springfield silt loams, frequently flooded. These level, somewhat poorly drained and poorly drained soils are on parallel ridges and in swales on low stream or marine terraces adjacent to tidal swamps or surrounded by the swamps. The soils are frequently flooded, mainly in winter and spring. Elevations are 3 to 5 feet above sea level. The Colyell soil is on low ridges that are 100 to 300 feet wide, and the Springfield soil is in swales and depressional areas that are 50 to 200 feet wide. Slopes range from 0 to 2 percent. The Colyell soil makes up about 60 percent of the map unit and the Springfield soil about 25 percent.

The Colyell soil is somewhat poorly drained. Typically, it has a surface layer of dark grayish brown silt loam about 4 inches thick. The next layer is yellowish brown, mottled silt loam about 18 inches thick. The upper part of the subsoil is yellowish brown, mottled silty clay, and the lower part to a depth of about 60 inches is light brownish gray, mottled silty clay loam and silt loam.

The Colyell soil is characterized by low fertility and moderately high levels of exchangeable aluminum that are potentially toxic to some crops. Permeability is slow. Plants can be adversely affected by a shortage of water during dry periods in the summer and fall of some years. The concentrations of sodium in the lower part of the subsoil restrict root development and limit the amount of water available to plants. Water runs off the surface at a medium rate. A perched water table is at a depth of 1.5 and 3.0 feet from December through April. The shrink-swell potential is high in the subsoil.

The Springfield soil is poorly drained. Typically, it has a surface layer of grayish brown silt loam about 3 inches thick. The subsurface layer is light brownish gray, mottled silt loam about 15 inches thick. The upper part of the subsoil is light brownish gray, mottled silty clay, and the lower part to a depth of about 60 inches is light olive brown, mottled silty clay loam.

The Springfield soil is characterized by low fertility and high levels of exchangeable aluminum 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 and stands in low areas for short periods after heavy rains. A seasonal high water table is about 0.5 foot to 2.0 feet below the surface from December through April.

Included with these soils in mapping are a few small areas of Barbary, Encrow, and Natalbany soils. Barbary soils are in the adjacent swamps. They are very fluid, clayey soils. Encrow soils are in landscape positions similar to those of the Springfield soil. They have a subsurface layer that extends into the subsoil. Natalbany soils are on flood plains along drainageways. They have neither an abrupt change in texture from the subsurface layer to the subsoil nor a subsurface layer that extends into the subsoil. Included soils make up about 15 percent of the map unit.

Most of the acreage of the Colyell and Springfield soils is used as woodland. A small acreage is used for campsites.

These soils are moderately well suited to loblolly pine and slash pine. The main concerns in producing and harvesting timber are soil compaction, a moderate equipment limitation, and moderate seedling mortality caused by flooding and wetness. After the trees are harvested, carefully managed reforestation can control competition from undesirable understory plants. Planting or harvesting during dry periods minimizes the formation of ruts and compaction. Special site preparation, such as harrowing and bedding, helps to establish seedlings, reduces the seedling mortality rate, and increases the early growth rate of the seedlings. Conventional methods of harvesting timber cannot be used during rainy periods, mainly from December to April.

These soils generally are not suited to cropland or pasture. Inaccessibility and the hazard of flooding are the main management concerns.

Because of a severe hazard of flooding, these soils generally are not suited to urban development or to intensive recreation uses. Low strength on sites for roads, the wetness, the high shrink-swell potential, the slow permeability, and inaccessibility are additional limitations.

These soils are well suited to habitat for deer, rabbits, quail, turkeys, doves, and numerous nongame birds. The habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by propagating desirable plants.

Both soils are in capability subclass Vw. The woodland ordination symbol assigned to the Colyell soil is 13W, and that assigned to the Springfield soil is 10W.

Dv—Deerford-Verdun silt loams. These soils are level, are somewhat poorly drained, and have high levels of sodium in the subsoil. They are on broad flats on stream or marine terraces. They are subject to rare flooding, which can occur after high-intensity rains of long duration. Areas range from about 20 to 1,000 acres in size. Slopes are less than 1 percent. The Deerford and Verdun soils each make up about 45 percent of this map unit.

Typically, the Deerford soil has a surface layer of dark grayish brown silt loam about 4 inches thick. The subsurface layer is brown silt loam about 6 inches thick. The upper part of the subsoil is brown and yellowish brown, mottled silty clay loam. The next part is light olive brown, mottled silty clay loam. The lower part to a depth of about 60 inches is light olive brown, mottled silt loam.

The Deerford soil is characterized by low fertility and moderately high levels of exchangeable aluminum that are potentially toxic to some crops. Water and air move through this soil at a slow rate. Plants can be adversely affected by a shortage of water during dry periods in the summer and fall of most years. The concentrations of sodium salts in the middle and lower parts of the subsoil limit the effective rooting depth and the amount of water available to plants. Water runs off the surface at a slow rate and stands in low areas for short periods after heavy rains. A seasonal high water table is about 0.5 foot to 1.5 feet below the surface from December through April. The shrink-swell potential is moderate.

Typically, the Verdun soil has a surface layer of dark grayish brown silt loam about 4 inches thick. The subsurface layer is light brownish gray, mottled silt loam about 8 inches thick. The upper part of the subsoil is grayish brown, mottled silty clay loam. The lower part to a depth of about 70 inches is yellowish brown, mottled silt loam.

The Verdun soil is characterized by low fertility. The subsoil has high levels of sodium that restrict root development and limit the amount of water available to plants. Water and air move through this soil at a very slow rate. Plants generally are adversely affected by a shortage of water during dry periods in the summer and fall of most years. Water runs off the surface at a slow rate and stands in low areas for short periods after heavy rains. A seasonal high water table is about 0.5 to 1.0 foot below the surface from December through April. The shrink-swell potential is moderate.

Included with these soils in mapping are a few small areas of Colyell, Gilbert, Olivier, and Springfield soils. None of these soils has a high content of sodium in the upper or middle part of the subsoil. Colyell soils are slightly lower on the landscape than the Deerford and Verdun soils. They have a clayey subsoil. Olivier soils are slightly higher on the landscape than the Deerford and Verdun soils. They have a fragipan. Gilbert soils are on broad flats or in depressional areas and are poorly drained. They are grayish throughout. Springfield soils are lower on the landscape than the Deerford and Verdun soils. They have a clayey subsoil. Included soils make up about 10 percent of the map unit.

The Deerford and Verdun soils are used mainly as woodland or pasture. A few small areas are used as homesites or recreation areas.

These soils are poorly suited to most crops. They are limited mainly by wetness, low fertility, and excess sodium. Also, potentially toxic levels of exchangeable aluminum are in the root zone of the Deerford soil. The sodium in both soils limits the number of suitable crops. The best suited plants are shallow-rooted ones that grow in cool seasons. Traffic pans form easily, but these can be broken up by deep plowing or chiseling. The surface tends to crust. Surface crusting and compaction can be minimized by returning crop residue to the soil. Proper row arrangement, field ditches, and vegetated outlets help to remove excess surface water. Minimizing tillage and including grasses, legumes, or a grass-legume mixture in the cropping sequence help to maintain fertility and tilth. Crops respond well to applications of lime and fertilizer, which improve fertility and help to offset the adverse effects of the sodium in the subsoil and the high levels of aluminum.

These soils are poorly suited to loblolly pine and slash pine. They are better suited to hardwoods, such as sweetgum and water oak. Production of pine trees is only moderate. Seedling mortality is moderate or severe because of the wetness and the high content of sodium salts in the soils. Other concerns in producing and harvesting timber are soil compaction and a moderate equipment limitation caused by wetness. High concentrations of sodium near the surface may affect plant growth. Soil compaction can be minimized by using suitable logging systems, laying out skid trails in advance, and harvesting timber when the soil is least susceptible to compaction. A drainage system and bedding of rows reduce the wetness and improve seedling survival. Conventional methods of harvesting timber cannot be used during rainy periods, generally from December to April.

These soils are moderately well suited to pasture. The main limitations are the wetness, low fertility, and the high content of sodium. The concentrations of sodium in the subsoil limit the choice of plants suitable for pasture. Common bermudagrass, white clover, and vetch are suitable pasture plants. Excess surface water can be removed by field ditches and suitable outlets. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Fertilizer and lime are needed if optimum production of grasses and legumes is to be achieved.

These soils are moderately well suited to habitat for deer, rabbits, quail, turkeys, doves, and nongame birds. The habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by propagating desirable plants.

Mainly because of the wetness, low strength on sites for roads, the excess sodium, the slow or very slow permeability, and the hazard of flooding, these soils are poorly suited to urban development. Excess water can be removed by shallow ditches. It also can be removed by providing the proper grade for drainage. Selection of adapted vegetation for planting is critical in areas used for lawns, shrubs, trees, and vegetable gardens. The design of local roads and streets can offset the limited traffic-supporting capacity. The slow or very slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. If flooding is controlled, lagoons or self-contained disposal units can be used to dispose of sewage properly.

Mainly because of the wetness, the flooding, the excess sodium, and the slow or very slow permeability, these soils are poorly suited to recreational development. A good drainage system and flood control are needed in intensively used areas, such as playgrounds and campsites. The plant cover can be maintained by applying fertilizer and controlling traffic.

In areas of the Deerford soil, the capability subclass is IIIw and the woodland ordination symbol is 7W. In areas of the Verdun soil, the capability subclass is IIIs and the woodland ordination symbol is 7T.

Dx—Dexter very fine sandy loam, 1 to 3 percent slopes. This soil is gently sloping and well drained. It is in convex areas on stream terraces along the major drainageways. Areas range from about 10 to 100 acres in size.

Typically, the surface layer is dark brown very fine sandy loam about 6 inches thick. The subsoil is about 40 inches thick. It is reddish brown silty clay loam in the upper part, yellowish red silty clay loam in the next part, and yellowish red clay loam in the lower part. The underlying material to a depth of about 60 inches is yellowish red fine sandy loam.

Included with this soil in mapping are a few small areas of Cahaba, Gilbert, Olivier, and Satsuma soils. Cahaba soils are in landscape positions similar to those of the Dexter soil. They contain more sand in the subsoil than the Dexter soil. Gilbert soils are in depressions and are poorly drained. They are grayish throughout. Olivier and Satsuma soils are lower on the landscape than the Dexter soil and are somewhat poorly drained. Olivier soils have a fragipan, and Satsuma soils have a subsurface layer that extends into the subsoil. Included soils make up about 10 percent of the map unit.

The Dexter soil is characterized by low fertility. Water and air move through this soil at a moderate rate, and water runs off the surface at a medium rate. Roots penetrate the soil easily, and the effective rooting depth is 60 inches or more. Plants generally are adversely affected by a shortage of water during dry periods in the summer and fall of most years. The soil dries quickly after rains. The shrink-swell potential is low.

Most of the acreage is pastured or used for homesite development. A small acreage is used as cropland or woodland. In places sand and gravel are mined for use as construction material.

This soil is well suited to pasture. Erosion is a moderate hazard. Low fertility is the main limitation. The main suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, and crimson clover. A seedbed should be prepared on the contour or across the slope. Proper stocking rates and pasture rotation help to keep the pasture in good condition. Fertilizer and lime are needed if the optimum growth of grasses and legumes is to be achieved.

This soil is well suited to loblolly pine and slash pine. Few limitations affect the production of timber. After the trees are harvested, carefully managed reforestation helps to control competition from undesirable understory plants. Conventional methods of harvesting timber generally can be used throughout the year.

This soil is moderately well suited to crops, mainly corn, grain sorghum, and vegetables. The hazard of erosion is moderate. The low fertility and moderately high levels of exchangeable aluminum within the root zone are limitations. The soil is friable and can be easily kept in good tilth. It can be worked throughout a wide range in moisture content. Crops can be adversely affected by a shortage of moisture during dry periods in some years. Returning all crop residue to the soil and including grasses, legumes, or a grass-legume mixture in the cropping sequence help to control erosion and maintain fertility and tilth. Contour farming and stripcropping also can help to control erosion. Most crops respond well to applications of lime and fertilizer, which help to overcome the low fertility and the moderately high levels of exchangeable aluminum.

This soil is well suited to homesite development and other urban uses. The main limitations are the slope and the moderate permeability. Preserving as many trees as possible on the building site helps to control erosion. The sides of shallow excavations cave in easily unless they are carefully supported. Seepage can be a problem if the soil is used as a site for sewage lagoons. The soil is a source of sand and gravel, but excessive silt and clay is a common problem. Enlarging septic tank absorption fields helps to overcome the moderate permeability in the subsoil.

This soil is well suited to recreational development. The slope is the only limitation. Erosion and sedimentation can be controlled by maintaining an adequate plant cover. The plant cover can be maintained by controlling traffic and applying fertilizer.

This soil is well suited to habitat for rabbits, quail, doves, deer, turkeys, and numerous nongame birds. The habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by propagating desirable plants.

The capability subclass is IIe. The woodland ordination symbol is 12A.

En—Encrow silt loam, occasionally flooded. This soil is level and poorly drained. It is in broad depressional areas and along small drainageways on stream or marine terraces. Flooding occurs about 5 to 50 times in 100 years. Areas are irregular in shape and range from 20 to 1,000 acres in size. Slopes are 0 to 1 percent.

Typically, the surface layer is grayish brown silt loam about 4 inches thick. The subsurface layer is light brownish gray, mottled silt loam about 8 inches thick. The next layer is light brownish gray, mottled silt loam and gray, mottled silty clay loam. The upper part of the subsoil is dark gray, mottled silty clay; the next part is gray, mottled silty clay and light brownish gray, mottled silty clay loam; and the lower part to a depth of about 60 inches is light olive gray, mottled silty clay loam.

Included with this soil in mapping are few small areas of Colyell, Deerford, Natalbany, Springfield, and Verdun soils. Colyell soils are on ridges and side slopes along drainageways and are somewhat poorly drained. They are brownish throughout. Deerford and Verdun soils are higher on the landscape than the Encrow soil. They have high levels of sodium in the subsoil. Natalbany soils are on flood plains. They are clayey throughout. Springfield soils are slightly higher on the landscape than the Encrow soil. They are characterizied by an abrupt change in texture from the subsurface layer to the subsoil. Included soils make up about 15 percent of the map unit.

The Encrow soil is characterized by low fertility and high levels of exchangeable aluminum that are potentially toxic to most crops. Permeability is slow. Plants can be adversely affected by a shortage of water during dry periods in the summer and fall of some years. Water runs off the surface at a very slow rate and stands in low areas for long periods after heavy rains. A seasonal high water table fluctuates between a depth of about 1.5 feet and the surface from December through April. The shrink-swell potential is high in the subsoil.

Most areas of this soil are used as woodland or pasture. A few areas are used for homesite or recreational development.

This soil is moderately well suited to loblolly pine and slash pine. The main limitations in producing and harvesting timber are soil compaction, the equipment limitation, and the seedling mortality caused by flooding and wetness. Competition from understory plants is an additional concern. Conventional methods of harvesting timber cannot be used during rainy periods or during periods of flooding, generally from December to April. Using standard wheeled and tracked equipment when the soil is moist causes the formation of ruts and compaction. Puddling can occur when the soil is wet. Using low-pressure ground equipment minimizes damage to the soil and helps to maintain productivity. After the trees are harvested, carefully managed reforestation can control competition from undesirable understory plants. Competing vegetation also can be controlled by proper site preparation and by spraying, cutting, or girdling, which can eliminate unwanted weeds, brush, or trees. Natural regeneration of pine is difficult in wet years. Bedding and a surface drainage system help to ensure that pine seedlings survive.

This soil is moderately well suited to pasture. The main limitations are the wetness, low fertility, and the hazard of flooding. Suitable pasture plants are common bermudagrass, bahiagrass, singletary peas, and vetch. Grazing when the soil is wet causes puddling and compaction of the surface layer, which reduce forage production. Excess surface water can be removed by field ditches and suitable outlets. Fertilizer and lime are needed if the optimum production of forage is to be achieved. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition.

Because of the wetness and the hazard of flooding, this soil is poorly suited to cropland. It is best suited to short-season crops that can be planted late in the growing season. Flood control is possible, but major flood-control structures, such as levees, are needed. Other limitations are low fertility and potentially toxic levels of exchangeable aluminum within the root zone. Field ditches and suitable outlets can remove excess surface water; however, maintaining ditches is difficult unless flooding is controlled. Crops respond well to fertilizer and lime, which help to overcome the low fertility and high levels of exchangeable aluminum.

Mainly because of the wetness and the hazard of flooding, this soil is poorly suited to recreational development. A good drainage system and flood-control measures are needed in intensively used areas, such as playgrounds and campsites.

This soil is poorly suited to urban development. Unless protected against flooding, it generally is not suited to dwellings. The main limitations are the wetness, the slow permeability, low strength on sites for roads, the high shrink-swell potential, and the hazard of flooding. Flooding can be controlled by major structures, such as levees and pumps. Roads and streets should be located above the level of flooding. The design of the roads and streets can offset the limited traffic-supporting capacity. Selection of adapted vegetation for planting is critical in areas used for lawns, shrubs, trees, and vegetable gardens. The slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. If flooding is controlled, lagoons or self-contained disposal units can be used to dispose of sewage properly. Properly designing the foundations and footings of buildings and diverting runoff away from the buildings help to prevent the structural damage caused by shrinking and swelling.

This soil is moderately well suited to habitat for deer, squirrels, rabbits, turkeys, and small furbearers. The habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by propagating desirable plants.

The capability subclass is IVw. The woodland ordination symbol is 9W.

Gb—Gilbert silt loam. This soil is level, is poorly drained, and has a high level of sodium in the lower part of the subsoil. It is on broad flats and in slightly depressional areas on stream or marine terraces. The soil is subject to rare flooding. The flooding occurs for brief to long periods, mainly in winter and spring. It can occur during the cropping season. Areas are irregular in shape and are 10 to several hundred acres in size. Slopes are less than 1 percent.

Typically, the surface layer is grayish brown silt loam about 4 inches thick. The subsurface layer is light brownish gray silt loam about 8 inches thick. The upper part of the subsoil is grayish brown and light brownish gray, mottled silty clay loam and silt loam. The lower part to a depth of about 60 inches is light brownish gray silty clay loam.

Included with this soil in mapping are a few small areas of Deerford, Myatt, Satsuma, and Verdun soils. Deerford, Satsuma, and Verdun soils are slightly higher on the landscape than the Gilbert soil. Deerford and Verdun soils have high levels of sodium in the upper or middle part of the subsoil. Satsuma soils do not have high levels of sodium in any part of the subsoil. Myatt soils are in landscape positions similar to those of the Gilbert soil. They contain more sand in the subsoil than the Gilbert soil. Also included are small areas of Gilbert soils that are occasionally flooded. Included soils make up about 15 percent of the map unit.

The Gilbert soil is characterized by low fertility and moderately high levels of exchangeable aluminum that are potentially toxic to some crops. Also, the high levels of sodium in the lower part of the subsoil restrict root development and limit the amount of water available to plants. 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 areas for long periods after heavy rains. A seasonal high water table is within a depth of 1.5 feet from December through April. The shrink-swell potential is moderate.

Most areas of this soil are used as woodland. A small acreage is used as pasture or cropland or for urban or recreational development.

This soil is moderately well suited to loblolly pine and slash pine. The main concerns in producing and harvesting timber are soil compaction, a severe equipment limitation, and moderate seedling mortality caused by wetness. Competition from understory plants also can be a concern. After the trees are harvested, carefully managed reforestation can control competition from undesirable understory plants. Planting or harvesting only during dry periods minimizes compaction. Conventional methods of harvesting timber cannot be used during rainy periods, generally from December to April.

This soil is moderately well suited to pasture. The main management concerns are low fertility and wetness. The main suitable pasture plants are common bermudagrass, bahiagrass, white clover, and southern winterpeas. Excess surface water can be removed by field ditches and suitable outlets. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Fertilizer and lime are needed if the optimum growth of grasses and legumes is to be achieved.

This soil is moderately well suited to crops, mainly vegetables. The main management concerns are wetness, low fertility, potentially toxic levels of exchangeable aluminum in the root zone, and high levels of sodium in the lower part of the subsoil. The soil is friable and can be easily worked; however, the surface layer tends to crust during dry periods. Proper row arrangement, field ditches, and vegetated outlets are needed to remove excess surface water. Returning all crop residue to the soil and including grasses, legumes, or a grass-legume mixture in the cropping sequence help to maintain fertility and tilth. Crops respond well to applications of lime and fertilizer, which help to overcome the low fertility and potentially toxic levels of exchangeable aluminum.

Mainly because of the wetness, the very slow permeability, low strength on sites for roads, the moderate shrink-swell potential, and the hazard of flooding, this soil is poorly suited to urban development. It has severe limitations as a site for buildings, local roads and streets, and most sanitary facilities. Flooding can be controlled by levees. Excess surface water can be removed by shallow ditches. It also can be removed by providing the proper grade for drainage. Selection of adapted vegetation for planting is critical in areas used for lawns, shrubs, trees, and vegetable gardens. The design of local roads and streets can offset the limited traffic-supporting capacity. Strengthening the foundations of buildings helps to prevent the structural damage caused by shrinking and swelling of the subsoil. The very slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. If flooding is controlled, lagoons or self-contained disposal units can be used to dispose of sewage properly.

This soil is poorly suited to recreational development. The main management concerns are the wetness, the very slow permeability, and the hazard of flooding. A good drainage system and flood-control measures are needed in intensively used areas, such as playgrounds and campsites.

This soil is moderately well suited to habitat for ducks, deer, rabbits, quail, turkeys, doves, and small furbearers. The habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by propagating desirable plants. The habitat for wetland wildlife can be improved by constructing shallow ponds for use by waterfowl and furbearers.

The capability subclass is IIIw. The woodland ordination symbol is 6W.

Ge—Gilbert-Brimstone silt loams, occasionally flooded. These soils are level, are poorly drained, and have high levels of sodium in the subsoil. They are in broad depressional areas and along drainageways on stream or marine terraces. They are occasionally flooded for brief to long periods, mainly in winter and spring. The flooding can occur during the cropping season. Areas are irregular in shape and range from 20 to several hundred acres in size. Slopes are less than 1 percent. The Gilbert soil makes up about 60 percent of the map unit and the Brimstone soil about 25 percent.

Typically, the Gilbert soil has a surface layer of grayish brown silt loam about 4 inches thick. The subsurface layer is light brownish gray silt loam about 8 inches thick. The upper part of the subsoil is grayish brown and light brownish gray, mottled silty clay loam. The lower part to a depth of about 60 inches is light brownish gray silty clay loam.

The Gilbert soil is characterized by low fertility and moderately high levels of exchangeable aluminum that are potentially toxic to some plants. Also, the high levels of sodium in the lower part of the subsoil restrict root development and limit the amount of water available to plants. 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 areas for long periods. A seasonal high water table is within a depth of 1.5 feet from December through April. The soil dries slowly after heavy rains. The shrink-swell potential is moderate.

Typically, the Brimstone soil has a surface layer of grayish brown silt loam about 4 inches thick. The subsurface layer is light brownish gray, mottled silt loam about 14 inches thick. The next layer is light brownish gray, mottled silt loam about 6 inches thick. The upper part of the subsoil is light brownish gray, mottled silt loam and silty clay loam; the next part is light brownish gray, mottled silty clay loam; and the lower part to a depth of about 60 inches is light brownish gray silty clay loam.

The Brimstone soil is characterized by low fertility and high levels of exchangeable aluminum 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 and stands in low areas for short periods after heavy rains. A seasonal high water table is within a depth of about 1.5 feet from December through April. The concentrations of sodium in the middle and lower parts of the subsoil restrict root development and limit the amount of water available to plants. The shrink-swell potential is moderate.

Included with these soils in mapping are a few small areas of Deerford, Olivier, Satsuma, and Verdun soils. All of these soils are higher on the landscape than the Gilbert and Brimstone soils. Deerford, Olivier, Satsuma, and Verdun soils are somewhat poorly drained. Deerford and Verdun soils are brownish throughout. Olivier soils have a fragipan. Also included are a few small areas of Gilbert soils that are subject to only rare flooding. Included soils make up about 15 percent of the map unit.

Most areas of the Gilbert and Brimstone soils are used as woodland or pasture. A small acreage is used as cropland or for homesite or recreational development.

These soils are moderately well suited to loblolly pine and slash pine. The main concerns in producing and harvesting timber are soil compaction, a severe equipment limitation, and moderate seedling mortality caused by wetness and flooding. Also, the excess sodium in the Brimstone soil somewhat limits tree growth, and competition from understory plants can be a concern. After the trees are harvested, carefully managed reforestation can control competition from undesirable understory plants. Planting or harvesting only during dry periods minimizes compaction. Conventional methods of harvesting timber cannot be used during rainy periods, generally from December to April.

These soils are moderately well suited to pasture. The main limitations are the low fertility, the flooding, and the wetness. Suitable pasture plants are common bermudagrass, bahiagrass, tall fescue, white clover, vetch, ryegrass, and southern winterpeas. Wetness limits the choice of plants and the period of grazing. Excess surface water can be removed by field ditches and suitable outlets. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Fertilizer and lime are needed if the optimum growth of grasses and legumes is to be achieved.

These soils are poorly suited to crops, mainly vegetables. They are limited mainly by the flooding, wetness, low fertility, and potentially toxic levels of sodium and aluminum within the root zone. The soils are friable and can be easily worked; however, the surface layer tends to crust during dry periods. Proper row arrangement, field ditches, and vegetated outlets are needed to remove excess surface water. Returning all crop residue to the soil and including grasses, legumes, or a grass-legume mixture in the cropping sequence help to maintain fertility and tilth. Crops respond well to applications of lime and fertilizer, which overcome the low fertility, the high levels of sodium, and the moderately high or high levels of exchangeable aluminum.

Because of the hazard of flooding and the wetness, these soils are poorly suited to most urban uses. Unless they are protected against flooding, they generally are not suited to dwellings. Other limitations are the moderate shrink-swell potential, the very slow or slow permeability, and low strength on sites for roads. Major structures, such as levees, can control flooding. Excess water can be removed by shallow ditches. It also can be removed by providing the proper grade for drainage. Roads and streets can be built above the level of flooding. The design of the roads and streets can offset the limited traffic-supporting capacity. Strengthening the foundations of buildings helps to prevent the structural damage caused by shrinking and swelling of the subsoil. Selection of adapted vegetation for planting is critical in areas used for lawns, shrubs, trees, and vegetable gardens because of the wetness and the high levels of sodium in the root zone. The slow or very slow permeability and the high water table increase the possibility that septic tank absorption fields will fail.

Because of the hazard of flooding, the slow or very slow permeability, and the wetness, these soils are poorly suited to recreational development. A good drainage system and flood-control measures are needed in most recreation areas. Controlling traffic helps to maintain the plant cover.

These soils are well suited to habitat for wetland wildlife and moderately well suited to habitat for woodland and openland wildlife. Suitable habitat can be provided for ducks, deer, rabbits, quail, turkeys, doves, and numerous small furbearers. The habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by propagating desirable plants. Oaks and other mast-producing trees are especially important to such wildlife as deer and turkey. The habitat for wetland wildlife can be improved by constructing shallow ponds, which provide open water areas for waterfowl and furbearers.

Both soils are in capability subclass IVw. The woodland ordination symbol assigned to the Gilbert soil is 6W, and that assigned to the Brimstone soil is 11T.

Gy—Guyton silt loam. This soil is level and poorly drained. It is on broad flats and in slightly depressional areas on stream or marine terraces. The soil is subject to rare flooding, which can occur during any part of the year but is most likely in winter and spring. Areas are irregular in shape and are 10 to 200 acres in size. Slopes are less than 1 percent.

Typically, the surface layer is grayish brown silt loam about 5 inches thick. The subsurface layer is light brownish gray, mottled silt loam about 19 inches thick. The upper part of the subsoil is gray, mottled silty clay loam and light brownish gray, mottled silt loam. The lower part to a depth of about 60 inches is gray, mottled silty clay loam.

Included with this soil in mapping are a few small areas of Abita, Myatt, and Stough soils. Abita and Stough soils are slightly higher on the landscape than the Guyton soil and are somewhat poorly drained. They are brownish throughout. Myatt soils are in landscape positions similar to those of the Guyton soil. They contain more sand in the subsoil than the Guyton soil. Also included are a few small areas of Guyton soils that are occasionally flooded. Included soils make up about 15 percent of the map unit.

The Guyton soil is characterized by low fertility and high levels of exchangeable aluminum 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 and stands in low areas for short periods after heavy rains. A seasonal high water table is within a depth of 1.5 feet from December through May. The shrink-swell potential is low.

Most of the acreage of this soil is used as woodland. A small acreage is used as pasture or cropland or for urban or recreational development.

This soil is moderately well suited to loblolly pine and slash pine. The main concerns in producing and harvesting timber are soil compaction, a severe equipment limitation, and moderate seedling mortality caused by wetness. After the trees are harvested, carefully managed reforestation can control competition from undesirable understory plants. Planting or harvesting only during dry periods minimizes the formation of ruts and compaction. Conventional methods of harvesting timber cannot be used during rainy periods, generally from December to May.

This soil is moderately well suited to pasture. The main management concerns are low fertility and wetness. Suitable pasture plants are common bermudagrass, bahiagrass, white clover, and southern winterpeas. Excess surface water can be removed by field ditches and suitable outlets. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Fertilizer and lime are needed if the optimum growth of grasses and legumes is to be achieved.

This soil is moderately well suited to crops, mainly vegetables. The main management concerns are wetness, low fertility, and potentially toxic levels of exchangeable aluminum within the root zone. This soil is friable and can be easily worked; however, the surface layer tends to crust during dry periods. Proper row arrangement, field ditches, and vegetated outlets are needed to remove excess surface water. Returning all crop residue to the soil and including grasses, legumes, or a grass-legume mixture in the cropping sequence help to maintain fertility and tilth. Crops respond well to applications of lime and fertilizer, which overcome the low fertility and the high levels of exchangeable aluminum.

Mainly because of the wetness, the slow permeability, low strength on sites for roads, and the hazard of flooding, the soil is poorly suited to buildings, local roads and streets, and most sanitary facilities. Excess water can be removed by shallow ditches. It also can be removed by providing the proper grade for drainage. Selection of adapted vegetation for planting is critical in areas used for lawns, shrubs, trees, and vegetable gardens. The design of local roads and streets can offset the limited traffic-supporting capacity. The slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. If flooding is controlled, lagoons or self-contained disposal units can be used to dispose of sewage properly.

Mainly because of the wetness and the hazard of flooding, this soil is poorly suited to recreational development. A good drainage system and flood-control measures are needed in intensively used areas, such as playgrounds and campsites. Controlling traffic helps to maintain the plant cover.

This soil is well suited to habitat for wetland wildlife and moderately well suited to habitat for openland and woodland wildlife. It can provide habitat for ducks, deer, rabbits, quail, turkeys, doves, and small furbearers. The habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by propagating desirable plants. Oak, hickory, and other mast-producing trees are especially important to deer and turkeys. Constructing small ponds can improve the habitat for waterfowl and furbearers.

The capability subclass is IIIw. The ordination symbol is 9W.

MA—Maurepas muck. This soil is level, very poorly drained, and very fluid. It is an organic soil that is in swamps. It is ponded most of the time. Areas range from about 100 to several thousand acres in size. Slopes are less than 1 percent. The number of observations made in these areas was fewer than the number in most other areas of the parish because of limited accessibility. The detail of mapping, however, is adequate for the expected use of the soil.

Typically, the surface layer is very dark grayish brown, very fluid muck about 12 inches thick. Below this to a depth of about 84 inches is dark yellowish brown and very dark grayish brown, very fluid muck.

Included with this soil in mapping are a few large areas of Barbary soils and soils having organic layers that are 16 to 51 inches deep over very fluid clay or mucky clay. Both of these soils are in landscape positions similar to those of the Maurepas soil. Barbary soils are very fluid, mineral soils. Also included, along streams and around lakes, are a few narrow bands of soils that are grayish, are loamy, and are 2 to 3 feet higher in elevation than the surrounding soils. Included soils make up about 15 percent of the map unit.

The Maurepas soil is ponded by several inches of freshwater most of the time. A seasonal high water table generally is at the surface or as much as 1 foot above the surface. During dry periods, however, it is as much as 6 inches below the surface. The soil has low strength. The total subsidence potential is very high. Permeability is rapid. The shrink-swell potential is low.

Most of the acreage of this soil supports native vegetation. It is used as habitat for wetland wildlife or as recreation areas, such as hunting grounds.

This soil is generally unsuited to commercial woodland. Wetness and poor trafficability are the main limitations. No areas are managed for timber production because natural regeneration of trees is poor and special harvesting equipment is needed. The soil cannot support the weight of most types of harvesting equipment.

The natural vegetation on this soil consists of water-tolerant trees and aquatic understory plants. The main trees are baldcypress, water tupelo, and black willow. The understory and aquatic vegetation consists mainly of alligatorweed, buttonbush, bulltongue, duckweed, pickerelweed, and water hyacinth.

This soil is well suited to extensive recreation areas and to habitat for wetland wildlife. It provides habitat for crawfish, ducks, squirrels, alligators, wading birds, and furbearers, such as raccoon, mink, and otter. White-tailed deer and swamp rabbits frequent areas of this soil during periods when the soil is dry or is not covered by deep water. Trapping of American alligator and furbearers is an important enterprise in most areas. Management that favors oaks and other mast-producing trees can improve the habitat for wood ducks, squirrels, deer, and nongame birds. Constructing shallow ponds can improve the habitat for waterfowl.

Because of wetness and low strength, this soil is not suited to pasture or cropland. It is generally too soft and boggy for grazing by livestock. A drainage system can be installed, but extensive water-control structures, such as levees and water pumps, are required.

This soil is not suited to intensive recreation uses or to urban uses. Wetness, low strength, and the potential for subsidence are too severe for these uses. A drainage system can be installed, but an extensive system of levees and water pumps is needed. Excavation is difficult because of buried logs and stumps. Subsidence is a continuing limitation after the soil is drained. The soil material is poorly suited to use in the construction of levees because it shrinks and cracks as it dries, causing the levees to fail.

The capability subclass is VIIIw. No woodland ordination symbol is assigned.

Mt—Myatt fine sandy loam. This soil is level and poorly drained. It is in broad depressional areas and along small drainageways on stream or marine terraces. It is subject to rare flooding, which can occur during any part of the year. Areas are irregular in shape and 20 to 500 acres in size. Slopes are less than 1 percent.

Typically, the surface layer is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer is light brownish gray, mottled fine sandy loam about 6 inches thick. The subsoil extends to a depth of about 58 inches. It is grayish brown, mottled loam in the upper part and gray and light brownish gray, mottled sandy clay loam in the lower part. The underlying material to a depth of about 60 inches is light gray, mottled sandy clay loam.

Included with this soil in mapping are a few small areas of Guyton, Satsuma, and Stough soils. Guyton soils are in landscape positions similar to those of the Myatt soil. They contain less sand in the subsoil than the Myatt soil. Satsuma and Stough soils are higher on the landscape than the Myatt soil. Also, they have a browner subsoil. Also included are small areas of Myatt soils that are occasionally flooded. Included soils make up about 10 percent of the map unit.

The Myatt soil is characterized by low fertility and high levels of exchangeable aluminum 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 or very slow rate. The surface layer remains wet for long periods after heavy rains. A seasonal high water table is within a depth of about 1 foot from November through April. Plants can be adversely affected by a shortage of water during dry periods in the summer and fall of some years.

Most areas of this soil are used as woodland. A small acreage is used for pasture, truck crops, or homesite or recreational development.

This soil is moderately well suited to loblolly pine and slash pine. The productivity potential is high, but management problems are severe. The main concerns in producing and harvesting timber are the restricted use of equipment and the seedling mortality caused by wetness. Plant competition also is a concern. Planting or harvesting only during dry periods minimizes soil compaction and the formation of ruts. Conventional methods of harvesting timber generally can be used, but they cannot be used during some rainy periods, generally from November to April. After the trees are harvested, carefully managed reforestation can control competition from undesirable understory plants. Competing vegetation also can be controlled by proper site preparation and by spraying, cutting, or girdling, which can eliminate unwanted weeds, brush, or trees.

This soil is moderately well suited to pasture. The main management concerns are low fertility and wetness. Suitable pasture plants are bahiagrass, common bermudagrass, white clover, southern winterpeas, and vetch. Excess water can be removed by field ditches and suitable outlets. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Fertilizer and lime are generally needed if the optimum growth of grasses and legumes is to be achieved.

This soil is moderately well suited to cultivated crops, mainly vegetables. Wetness, low fertility, and potentially toxic levels of exchangeable aluminum are the main limitations. Proper row arrangement, field ditches, and suitable outlets are needed to remove excess surface water. Returning all crop residue to the soil and including grasses, legumes, or a grass-legume mixture in the cropping sequence help to maintain fertility and tilth. Crops respond well to applications of lime and fertilizer, which help to overcome the low fertility and the high levels of aluminum in the root zone.

Mainly because of the wetness, the flooding, low strength on sites for roads, and the moderately slow permeability, this soil is poorly suited to buildings, local roads and streets, and most sanitary facilities. A drainage system is needed if roads and building foundations are constructed. A drainage system also is needed in areas used for lawns, shade trees, ornamental trees, shrubs, vines, and vegetable gardens. Excess water can be removed by shallow ditches. It also can be removed by providing the proper grade for drainage. In areas where levees are not constructed to control flooding, buildings and roads can be raised to elevations above normal flood levels. The moderately slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. If flooding is controlled, lagoons or self-contained disposal units can be used to dispose of sewage properly.

Mainly because of the flooding and the wetness, this soil is poorly suited to recreational uses. A good drainage system is needed in most recreation areas. Flood control is needed in areas used as campsites. Controlling traffic helps to maintain the plant cover.

This soil is well suited to habitat for deer, rabbits, ducks, quail, squirrels, turkeys, doves, and numerous small furbearers. The habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by propagating desirable plants. Controlled burning in wooded areas can increase the amount of browse palatable to deer and the number of seed-producing plants available to quail, turkey, and other nongame birds.

The capability subclass is IIIw. The woodland ordination symbol is 9W.

My—Myatt fine sandy loam, occasionally flooded. This soil is level and poorly drained. It is in broad depressional areas and along small drainageways on stream or marine terraces. It is occasionally flooded for brief periods. The flooding usually occurs in winter and spring, but it can occur during any part of the year. Areas are irregular in shape and range from 20 to several hundred acres in size. Slopes are less than 1 percent.

Typically, the surface layer is dark grayish brown fine sandy loam about 5 inches thick. The subsurface layer is about 7 inches thick. It is light brownish gray, mottled fine sandy loam. The subsoil to a depth of about 60 inches is light gray, mottled sandy clay loam and clay loam.

Included with this soil in mapping are a few small areas of Gilbert, Satsuma, and Stough soils. Satsuma and Stough soils are higher on the landscape than the Myatt soil and are somewhat poorly drained. They have a brownish subsoil. Gilbert soils are in landscape positions similar to those of the Myatt soil. They contain less sand in the subsoil than the Myatt soil. Also included are small areas of Myatt soils that are subject to only rare flooding. Included soils make up about 15 percent of the map unit.

The Myatt soil is characterized by low fertility and high levels of exchangeable aluminum 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 areas for long periods after heavy rains. The soil dries slowly after heavy rains. A seasonal high water table is within a depth of about 1 foot from November through April. The shrink-swell potential is low.

Most areas of this soil are used as woodland or pasture. A small acreage is developed for intensive recreation uses, such as playgrounds and campsites.

This soil is moderately well suited to loblolly pine, slash pine, and sweetgum. The productivity potential is high, but management problems are severe. The main concerns in producing and harvesting timber are a severe equipment limitation and severe seedling mortality caused by flooding and wetness. Moderate plant competition also can be a concern. Planting or harvesting only during dry periods minimizes the formation of ruts and compaction. Conventional methods of harvesting timber generally can be used, but they cannot be used during some rainy periods, generally from November to April. After the trees are harvested, carefully managed reforestation can control competition from undesirable understory plants. Competing vegetation also can be controlled by proper site preparation and by spraying, cutting, or girdling, which can eliminate unwanted weeds, brush, or trees.

This soil is moderately well suited to pasture. The main management concerns are low fertility, the wetness, and flooding. Suitable pasture plants are common bermudagrass, bahiagrass, white clover, and southern winterpeas. Wetness limits the choice of plants and the period of grazing. Excess surface water can be removed by field ditches and suitable outlets. Flood control is possible, but only in areas where major flood-control structures are constructed. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Fertilizer and lime are needed if the optimum growth of grasses and legumes is to be achieved.

Mainly because of low fertility, potentially toxic levels of exchangeable aluminum, wetness, and the hazard of flooding, this soil is poorly suited to cultivated crops. A drainage system and flood control are needed if crops are grown. Returning all crop residue to the soil and including grasses, legumes, or a grass-legume mixture in the cropping sequence help to maintain fertility and tilth. Crops respond well to applications of lime and fertilizer, which help to overcome the low fertility and the high levels of exchangeable aluminum in the root zone.

This soil is poorly suited to most urban uses. It is generally not suited to dwellings unless it is protected against flooding. It has severe limitations as a site for buildings, local roads and streets, and most sanitary facilities, mainly because of the flooding, the wetness, low strength on sites for roads, and the moderately slow permeability. Major flood-control structures are needed. Excess water can be removed by shallow ditches. It also can removed by providing the proper grade for drainage. Roads and streets can be built above the level of flooding. The design of the roads and streets can offset the limited traffic-supporting capacity. Selection of adapted vegetation for planting is critical in areas used for lawns, shrubs, trees, and vegetable gardens. The moderately slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. If flooding is controlled, lagoons or self-contained disposal units can be used to dispose of sewage properly.

This soil is poorly suited to recreational development, mainly because of wetness. Flooding is a hazard in areas used as campsites. A good drainage system is needed in most recreation areas. Controlling traffic helps to maintain the plant cover.

This soil is well suited to habitat for wetland wildlife and moderately well suited to habitat for openland wildlife and woodland wildlife. It can provide habitat for ducks, deer, rabbits, quail, turkeys, doves, and numerous small furbearers. The habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by propagating desirable plants. The habitat for waterfowl and furbearers can be improved by constructing shallow ponds.

The capability subclass is IVw. The woodland ordination symbol is 9W.

Na—Natalbany silty clay loam, frequently flooded. This soil is level and poorly drained. It is on the flood plains along streams near swamps. It is frequently flooded for long periods. The flooding can occur during any part of the year but is most likely in winter and spring. Areas are irregular in shape and range from 50 to several hundred acres in size. Slopes are less than 1 percent.

Typically, the surface layer is dark grayish brown silty clay loam about 5 inches thick. The subsoil extends to a depth of about 60 inches. It is dark gray, mottled silty clay in the upper part; dark gray and grayish brown, mottled clay in the next part; and grayish brown, mottled silty clay in the lower part. The underlying material to a depth of about 80 inches is grayish brown, mottled silty clay.

Included with this soil in mapping are a few small areas of Barbary, Colyell, and Springfield soils. Barbary soils are in swamps and are very poorly drained. They are very fluid, mineral soils. Colyell and Springfield soils are higher on the landscape than the Natalbany soil. Colyell soils are somewhat poorly drained. They are brownish throughout. Springfield soils are characterized by an abrupt change in texture between the subsurface layer and the subsoil. Included soils make up about 15 percent of the map unit.

The Natalbany soil is characterized by low fertility and high levels of exchangeable aluminum 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. Plants can be adversely affected by a shortage of water during dry periods in the summer and fall of some years. A seasonal high water table is within a depth of 1 foot from December through April. The shrink-swell potential is very high.

In most areas this soil is used as woodland. A small acreage is used as pasture or extensive recreation areas.

This soil is poorly suited to water oak, willow oak, water tupelo, American elm, eastern cottonwood, and green ash. The potential productivity is only moderate, and management is difficult. The main concerns in producing and harvesting timber are soil compaction, a severe equipment limitation, and moderate seedling mortality caused by wetness and flooding. The only trees that should be selected for planting are those that can withstand seasonal wetness. Planting and harvesting only during dry periods minimizes the formation of ruts and compaction. Conventional methods of harvesting timber generally can be used, but they cannot be used during some rainy periods, generally from December to April.

This soil is poorly suited to pasture, mainly because of the wetness, the low fertility, and the hazard of flooding. Suitable pasture plants are common bermudagrass, singletary peas, and vetch. The use of equipment is limited by the wetness. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Fertilizer and lime are needed if the optimum growth of grasses and legumes is to be achieved.

Because of the hazard of flooding and the wetness, this soil generally is not suited to cropland, to urban development, or to intensive recreation uses.

This soil is well suited to habitat for wetland wildlife and moderately well suited to habitat for openland and woodland wildlife. It provides habitat for deer, squirrels, rabbits, ducks, turkeys, and numerous small furbearers. The habitat for most kinds of wildlife can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by propagating desirable plants. Oak, hickory, and other mast-producing trees are especially important to deer and turkeys. Constructing shallow ponds can improve the habitat for waterfowl and furbearers.

The capability subclass is Vw. The woodland ordination symbol is 4W.

Oe—Olivier silt loam, 0 to 1 percent slopes. This soil is level and somewhat poorly drained. It is on broad, slightly convex ridges on stream terraces. Areas range from about 20 to 200 acres in size.

Typically, the surface layer is dark brown silt loam about 5 inches thick. The subsurface layer is light yellowish brown silt loam about 3 inches thick. The upper part of the subsoil is yellowish brown, mottled silt loam about 15 inches thick. The lower part to a depth of about 63 inches is a fragipan of yellowish brown, mottled silty clay loam.

Included with this soil in mapping are a few small areas of Calhoun, Dexter, and Gilbert soils. None of these soils has a fragipan. Calhoun and Gilbert soils are in depressions and along drainageways and are poorly drained. They are grayish throughout. Dexter soils are in convex areas and are well drained. They have a subsoil that is reddish in the lower part. Included soils make up about 10 percent of the map unit.

The Olivier soil is characterized by medium fertility and high levels of exchangeable aluminum that are potentially toxic to most crops. Water and air move through the fragipan at a slow rate. Water runs slowly off the surface. A seasonal high water table is about 1.0 to 2.5 feet below the surface from December through April. The surface layer dries quickly after heavy rains. The effective rooting depth is limited by the fragipan. The shrink-swell potential is moderate in the subsoil.

Most of the acreage of this soil is used as woodland or pasture. A small acreage is used for vegetables or for homesite or recreational development.

This soil is well suited to loblolly pine and slash pine. The potential productivity is high. The main concerns in producing and harvesting timber are a moderate equipment limitation and soil compaction caused by wetness. Competition from understory plants is an additional concern. After the trees are harvested, carefully managed reforestation can control competition from undesirable understory plants. Competing vegetation also can be controlled by proper site preparation and by spraying, cutting, or girdling, which can eliminate unwanted weeds, brush, or trees. Planting or harvesting only during dry periods minimizes compaction and the formation of ruts. Conventional methods of harvesting timber cannot be used during rainy periods, generally from December to April.

This soil is well suited to pasture. The main limitations are wetness and medium fertility. Suitable pasture plants are bahiagrass, common bermudagrass, improved bermudagrass, white clover, southern winterpeas, vetch, tall fescue, and ryegrass. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Fertilizer and lime are needed if the optimum growth of grasses and legumes is to be achieved. Excess surface water can be removed by field ditches and suitable outlets.

This soil is moderately well suited to crops, mainly vegetables, corn, and grain sorghum. Wetness, medium fertility, and potentially toxic levels of exchangeable aluminum are the main limitations. The soil is friable and can be easily worked; however, crusts tend to form on the surface. Also, traffic pans can form if the soil is tilled when it is wet. The pan can be broken by subsoiling when the soil is dry. Proper row arrangement, field ditches, and suitable outlets are needed to remove excess surface water. Returning all crop residue to the soil and including grasses, legumes, or a grass-legume mixture in the cropping sequence help to maintain fertility and tilth. Crops respond well to applications of lime and fertilizer, which help to overcome the medium fertility and the high levels of exchangeable aluminum in the root zone.

This soil is poorly suited to urban development. It has severe limitations as a site for buildings, local roads and streets, and most sanitary facilities because of the wetness, low strength on sites for roads, the moderate shrink-swell potential, and the slow permeability. Excess water can be removed by shallow ditches. It also can be removed by providing the proper grade for drainage. The design of roads and streets can offset the limited traffic-supporting capacity. The slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. Lagoons or self-contained disposal units can be used to dispose of sewage properly. Strengthening the foundations of buildings helps to prevent the structural damage caused by shrinking and swelling of the subsoil. A drainage system is needed in areas used for most lawn grasses, shade trees, ornamental trees, shrubs, vines, and vegetable gardens.

This soil is moderately well suited to recreational development. The main management concerns are the wetness and the slow permeability. A good drainage system is needed in intensively used areas, such as playgrounds and campsites.

This soil is well suited to habitat for openland and woodland wildlife. It provides habitat for deer, rabbits, quail, turkeys, doves, and numerous nongame birds. The habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by propagating desirable plants. Controlled burning in wooded areas can increase the amount of browse palatable to deer and the number of seed-producing plants available to quail, turkeys, and other nongame birds.

The capability subclass is IIw. The woodland ordination symbol is 9W.

Or—Olivier silt loam, 1 to 3 percent slopes. This soil is gently sloping and somewhat poorly drained. It is on low ridges and side slopes along drainageways on stream terraces. Areas range from about 10 to 100 acres in size.

Typically, the surface layer is dark brown silt loam about 4 inches thick. The upper part of the subsoil is yellowish brown, mottled silt loam about 26 inches thick. The lower part to a depth of about 60 inches is a fragipan of yellowish brown, mottled silty clay loam.

Included with this soil in mapping are a few small areas of Calhoun and Dexter soils. Neither of these soils has a fragipan. Calhoun soils are in depressions and along drainageways and are poorly drained. They are grayish throughout. Dexter soils are higher on the landscape than the Olivier soil and are well drained. They have a subsoil that is reddish in the lower part. Included soils make up about 10 percent of the map unit.

The Olivier soil is characterized by medium fertility and high levels of exchangeable aluminum that are potentially toxic to most crops. Permeability is slow in the fragipan. Water runs off the surface at a medium rate. A seasonal high water table is perched above the fragipan. It is about 1.0 to 2.5 feet below the surface from December through April. The surface layer dries quickly after rains. The effective rooting depth is limited by the fragipan. The shrink-swell potential is moderate in the subsoil.

Most areas of this soil are used as woodland or pasture. A few areas are used as cropland, homesites, or intensive recreation areas.

This soil is well suited to loblolly pine and slash pine. The potential productivity is high. The main concerns in producing and harvesting timber are the equipment limitation and soil compaction caused by wetness. Competition from understory plants can be an additional concern. After the trees are harvested, carefully managed reforestation can control competition from undesirable understory plants. Competing vegetation also can be controlled by proper site preparation and by spraying, cutting, or girdling, which can eliminate unwanted weeds, brush, or trees. Planting and harvesting only during dry periods minimize compaction and the formation of ruts.

This soil is well suited to pasture. The main limitations are the medium fertility and a moderate hazard of erosion. Suitable pasture plants are bahiagrass, common bermudagrass, improved bermudagrass, ball clover, crimson clover, arrowleaf clover, and ryegrass. A seedbed should be prepared on the contour if possible. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Fertilizer and lime are needed if the optimum growth of grasses and legumes is to be achieved.

This soil is moderately well suited to cultivated crops, mainly corn, grain sorghum, and vegetables. Erosion is the main hazard. Medium fertility, wetness, and potentially toxic levels of exchangeable aluminum are the main limitations. A seedbed should be prepared on the contour or across the slope. The soil is friable and can be worked throughout a wide range in moisture content, but the surface layer tends to crust and tillage pans can form if the soil is worked when wet. Runoff and erosion can be controlled by plowing in the fall, by applying fertilizer, and by seeding a cover crop. Returning all crop residue to the soil and including grasses, legumes, or a grass-legume mixture in the cropping sequence help to maintain fertility and tilth. Excess surface water can be removed by shallow ditches. Crops respond well to applications of lime and fertilizer, which help to overcome the medium fertility and the high levels of exchangeable aluminum in the root zone.

Mainly because of low strength on sites for roads, the slow permeability, and the wetness, this soil is poorly suited to urban development. The hazard of erosion and the moderate shrink-swell potential are additional limitations. A drainage system is needed if buildings are constructed. Preserving the existing plant cover during construction helps to control erosion. The design of local roads and streets can offset the limited traffic-supporting capacity. The slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. The design of foundations and roads can help to prevent the damage caused by shrinking and swelling of the subsoil.

This soil is moderately well suited to recreational development. The main management concerns are the wetness and the slow permeability. Erosion is a hazard in areas used as sites for playgrounds. A good drainage system is needed in most recreation areas. Seeding or mulching areas that have been cut and filled helps to control erosion. Maintaining a good plant cover helps to control runoff and erosion.

This soil is well suited to habitat for openland and woodland wildlife. It provides habitat for deer, squirrels, rabbits, turkeys, quail, doves, and numerous nongame birds. The habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by propagating desirable plants.

The capability subclass is IIe. The woodland ordination symbol is 9W.

OU—Ouachita, Ochlockonee, and Guyton soils, frequently flooded. These soils are gently sloping or level. They are on flood plains along the major streams. They are frequently flooded for very brief to long periods. The flooding can occur during any part of the year but is most likely in winter and spring. The Ouachita and Ochlockonee soils are well drained and are on low ridges. The Guyton soil is poorly drained and is in low positions on the landscape. Areas range from 200 to several thousand acres in size. They are about 35 percent Ouachita soil, 30 percent Ochlockonee soil, and 20 percent Guyton soil. Most mapped areas contain all three soils, but some areas contain only one or two. Slopes range from 1 to 3 percent on the ridges and are less than 1 percent in the low positions between the ridges.

Typically, the Ouachita soil has a surface layer of brown silt loam about 5 inches thick. The upper part of the subsoil is yellowish brown silt loam, the next part is dark yellowish brown silty clay loam, and the lower part to a depth of about 60 inches is yellowish brown silt loam.

The Ouachita soil is characterized by low fertility and high levels of exchangeable aluminum 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. The water table is 6 feet or more below the surface throughout the year. Plants can be adversely affected by a shortage of water during dry periods in the summer and fall of some years. The shrink-swell potential is low.

Typically, the Ochlockonee soil has a surface layer of brown sandy loam about 5 inches thick. The upper part of the underlying material is yellowish brown sandy loam. The lower part to a depth of about 60 inches is yellowish brown loamy sand.

The Ochlockonee soil is characterized by low fertility and moderately high levels of exchangeable aluminum that are potentially toxic to some crops. Water and air move through this soil at a moderately rapid rate. Water runs off the surface at a slow rate. The seasonal high water table is 3 to 5 feet below the surface from December through April. Plants can be adversely affected by a shortage of water during dry periods in the summer and fall of some years. The shrink-swell potential is low.

Typically, the Guyton soil has a surface layer of dark grayish brown silt loam about 6 inches thick. The subsurface layer is grayish brown and light brownish gray silt loam about 18 inches thick. The subsoil to a depth of about 66 inches is mottled silty clay loam. The upper part is grayish brown, and the lower part is gray.

The Guyton soil is characterized by low fertility and high levels of exchangeable aluminum 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 or very slow rate. A seasonal high water table is within a depth of about 1.5 feet from December through May. The surface layer is wet for long periods in winter and spring. The shrink-swell potential is low.

Included with these soils in mapping are a few small areas of the well drained Cahaba and Dexter soils on ridges. Part of the subsoil of these included soils is reddish. Also included are soils that are more sandy than the Guyton soil. Included soils make up about 15 percent of the map unit.

Most areas of the Ouachita, Ochlockonee, and Guyton soils are used as woodland. A small acreage is used for pasture.

These soils are moderately well suited to loblolly pine, Nuttall oak, yellow poplar, sweetgum, eastern cottonwood, and American sycamore. The potential productivity is high, but management is difficult. The main concerns in producing and harvesting timber are a severe equipment limitation, soil compaction, and a high seedling mortality rate caused by wetness and flooding. Competition from understory plants also can be a concern. Conventional methods of harvesting timber cannot be used during rainy periods or during periods of flooding, generally from December to May. Planting and harvesting only during dry periods minimizes compaction and the formation of ruts.

Because of the flooding, these soils are poorly suited to pasture. Wetness is a limitation in the Guyton soil. Low fertility is a limitation in all of the soils. Suitable pasture plants are common bermudagrass, bahiagrass, singletary peas, and vetch. The use of equipment is limited by the wetness. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Fertilizer and lime are needed if the optimum growth of grasses and legumes is to be achieved.

These soils generally are not suited to cultivated crops, urban uses, or intensive recreation uses, such as playgrounds and campsites. The hazard of flooding is too severe for these uses.

These soils are well suited to habitat for deer, ducks, turkeys, squirrels, rabbits, and numerous other small furbearers. The habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by propagating desirable plants. The habitat for waterfowl can be improved by constructing shallow ponds.

All three soils are in capability subclass Vw. The woodland ordination symbol assigned to the Ouachita soil is 9W, that assigned to the Ochlockonee soil is 11W, and that assigned to the Guyton soil is 8W.

Pa—Pits-Arents complex, 0 to 5 percent slopes. This map unit consists of open excavations from which sand, gravel, or loamy material has been removed and the piles of soil material that was left beside the pits after the sand, gravel, or loamy material was removed. Areas range from about 5 to several hundred acres in size. The Pits make up about 65 percent of the unit and the Arents about 25 percent.

Gravel pits are open excavations from which gravel has been mined. Most of these pits are on terraces along the Amite River in the northern and central parts of the parish. Sand pits are areas from which only sand has been removed. Borrow pits are areas from which soil material and the underlying material have been removed for use in the construction of roads and as fill material.

The floor and walls of most pits are exposed geologic strata. Fertility is low, and the soil material generally is droughty. Pits support little or no vegetation, but a few willow trees and annual weeds grow on the floor of some pits. Some pits are ponded for long periods during the wetter parts of the year.

Typically, the Arents consist of stratified and mixed, sandy and loamy soil material. These soils are spoil banks or piles of soil material left beside or in the pits.

The Arents are characterized by low fertility. The seasonal high water table is below a depth of 6 feet in most areas. The available water capacity and permeability vary within short distances. In many areas the soils are droughty.

Included in this unit in mapping are a few small undisturbed areas of Cahaba, Dexter, Guyton, and Ochlockonee soils. These soils have an orderly sequence of soil layers. Also included are one large hazardous waste pit in section 6, T. 7 S., R. 5 E., and one small waste disposal dump in section 32, T. 6 S., R. 4 E. Included areas make up about 10 percent of the map unit.

Most areas of this map unit are idle or are used only as extensive recreation areas and as habitat for wildlife. The natural vegetation is mainly annual and perennial grasses and forbs. Scrub pine grows in some areas of the Arents, and willow trees grow in some of the pits.

This map unit is poorly suited to crops, pasture, woodland, and urban development. The uneven topography, restricted drainage, ponding, and erosion hazard are the main limitations. Pits require major reclamation before they can be used for crops or pasture. Planting common bermudagrass or pine trees on the Arents can help to control erosion, but the grass and trees grow slowly because of low fertility and droughtiness. Water collects in some of the pits. These pits provide habitat for ducks.

No capability subclass or woodland ordination symbol is assigned.

Sa—Satsuma silt loam, 1 to 3 percent slopes. This soil is gently sloping and somewhat poorly drained. It is on broad, slightly convex ridges and on side slopes along drainageways on stream or marine terraces. It is subject to rare flooding, which can occur during any part of the year but is most likely in winter and spring. Areas are irregular in shape and range from 10 to 500 acres in size.

Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The next layer is light yellowish brown, mottled silt loam about 8 inches thick. Below this is about 6 inches of yellowish brown, mottled silty clay loam and light gray silt loam. The upper part of the subsoil is strong brown, mottled silty clay loam; the next part is yellowish brown, mottled clay loam; and the lower part to a depth of about 65 inches is strong brown, mottled loam.

Included with this soil in mapping are few small areas of Abita, Cahaba, Dexter, Gilbert, and Olivier soils. Abita soils are in landscape positions similar to those of the Satsuma soil. Their subsoil of accumulated clay is thicker than that of the Satsuma soil. Cahaba and Dexter soils are higher on the landscape than the Satsuma soil. They have a reddish subsoil. Gilbert soils are in depressions and along drainageways. They are grayish throughout. Olivier soils are in landscape positions similar to those of the Satsuma soil. They have a fragipan. Also included are a few small areas of soils that contain more sand throughout than the Satsuma soil. Included soils make up about 15 percent of the map unit.

The Satsuma soil is characterized by low fertility and high levels of exchangeable aluminum that are potentially toxic to most crops. Permeability is slow in the subsoil. Plants are adversely affected by a shortage of water during dry periods in the summer and fall of some years. Water runs off the surface at a medium rate. The soil has a seasonal high water table about 1.0 to 2.5 feet below the surface from December through April. The shrink-swell potential is moderate in the subsoil.

Most areas of this soil are used as woodland or pasture. A small acreage is used as cropland, homesites, or extensive recreation areas.

This soil is well suited to loblolly pine and slash pine. The concerns in producing and harvesting timber are soil compaction and a moderate equipment limitation caused by the wetness. Competition from understory plants is an additional concern. Maintaining the plant cover helps to control erosion. Conventional methods of harvesting timber generally can be used, but they cannot be used during some rainy periods, generally from December to April. Using standard wheeled and tracked equipment when the soil is moist causes the formation of ruts and compaction. Puddling can occur when the soil is wet. Using low-pressure ground equipment or planting and harvesting only during dry periods minimizes damage to the soil and helps to maintain productivity.

This soil is moderately well suited to cultivated crops, mainly vegetables. The hazard of erosion, wetness, low fertility, and potentially toxic levels of exchangeable aluminum within the root zone are the main limitations. The soil is friable and can be easily worked; however, excessive cultivation can result in the formation of a tillage pan. This pan can be broken by subsoiling when the soil is dry. Minimizing tillage and returning all crop residue to the soil or regularly adding other organic material improve fertility and help to maintain tilth and the content of organic matter. Most crops respond well to applications of fertilizer and lime, which help to overcome the low fertility and the high levels of exchangeable aluminum. The hazard of erosion can be reduced if fall grain or winter pasture grasses are seeded early and the soil is tilled and seeded on the contour or across the slope.

This soil is well suited to pasture. The low fertility and a moderate hazard of erosion are the main limitations. Suitable pasture plants are common bermudagrass, improved bermudagrass, bahiagrass, white clover, and vetch. A seedbed should be prepared on the contour or across the slope if possible. Fertilizer and lime are needed if the optimum growth of grasses and legumes is to be achieved.

Mainly because of the flooding, the wetness, the slow permeability, low strength on sites for roads, and seepage on sites for sewage lagoons, this soil is poorly suited to urban development. Excess water can be removed by shallow ditches. It also can be removed by providing the proper grade for drainage. Preserving the existing plant cover during construction or revegetating disturbed areas around construction sites as soon as possible helps to control erosion. Flooding can be controlled by levees. The design of local roads and streets can offset the limited traffic-supporting capacity. The slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. Sewage lagoons or self-contained disposal units can be used to dispose of sewage properly. Applying fertilizer, seeding, mulching, and shaping the slopes help to establish and maintain a plant cover. Properly designing the foundations and footings of buildings helps to prevent the structural damage caused by shrinking and swelling. Sealing the walls and floor of sewage lagoons with impervious material helps to prevent seepage of the effluent from the lagoon and the contamination of ground water.

This soil is moderately well suited to recreational development. The main management concerns are the wetness, the slow permeability, and the hazard of erosion. Flooding is a hazard in areas used for campsites. A good drainage system is needed in intensively used areas, such as playgrounds and campsites. Maintaining an adequate plant cover helps to control runoff and erosion. The plant cover can be maintained by applying fertilizer and controlling traffic. Flooding can be controlled, but major structures, such as levees and pumps, are needed.

This soil is well suited to habitat for deer, rabbits, quail, turkeys, doves, and numerous nongame birds. The habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by propagating desirable plants. Controlled burning can increase the amount of palatable browse for deer and the number of seed-producing plants available to quail and turkeys.

The capability subclass is IIe. The woodland ordination symbol is 11W.

Sp—Springfield silt loam. This soil is level and poorly drained. It is on broad ridges on stream or marine terraces. Areas range from 10 to 200 acres in size. Slopes are 0 to 1 percent.

Typically, the surface layer is grayish brown, mottled silt loam about 3 inches thick. The subsurface layer is mottled silt loam about 10 inches thick. It is light brownish gray in the upper part and light gray in the lower part. The upper part of the subsoil is grayish brown, mottled silty clay. The lower part to a depth of about 60 inches is yellowish brown, mottled silty clay loam.

Included with this soil in mapping are a few small areas of Colyell, Deerford, Encrow, and Verdun soils. All of these soils, except for the Encrow soils, are somewhat poorly drained and are slightly higher on the landscape than the Springfield soil. Colyell soils are not characterized by an abrupt change in texture between the subsurface layer and the subsoil. Deerford and Verdun soils have high levels of exchangeable sodium in the subsoil. Encrow soils are in depressions and are poorly drained. They have a subsurface layer that tongues into the subsoil. Included soils make up about 10 percent of the map unit.

The Springfield soil is characterized by low fertility and high levels of exchangeable aluminum in the root zone. Water and air move through this soil at a slow rate. Water runs off the surface at a slow rate and stands in low areas for short periods after heavy rains. A seasonal high water table is 0.5 foot to 2.0 feet below the surface from December through April. The shrink-swell potential is high.

Most areas are used as woodland. A few areas are used for pasture or for homesite development.

The soil is moderately well suited to loblolly pine and slash pine. The main concerns in producing and harvesting timber are soil compaction and the equipment limitation caused by wetness. Competition from understory vegetation is an additional concern. After the trees are harvested, carefully managed reforestation can control competition from undesirable understory plants. Competing vegetation also can be controlled by proper site preparation and by spraying, cutting, or girdling, which can eliminate unwanted weeds, brush, or trees. Planting and harvesting only during dry periods minimizes compaction and the formation of ruts. Conventional methods of harvesting timber cannot be used during rainy periods, generally from December to April.

This soil is moderately well suited to pasture. The main limitations are the wetness and the low fertility. Suitable pasture plants are bahiagrass, common bermudagrass, white clover, southern winterpeas, vetch, tall fescue, and ryegrass. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Fertilizer and lime are needed if the optimum growth of grasses and legumes is to be achieved.

This soil is moderately well suited to cultivated crops, mainly vegetables. The main management concerns are wetness, low fertility, and potentially toxic levels of exchangeable aluminum in the root zone. The soil is friable and can be easily kept in good tilth. It can be worked throughout a wide range in moisture content. Proper row arrangement, field ditches, and suitable outlets are needed to remove excess surface water. Returning all crop residue to the soil and including grasses, legumes, or a grass-legume mixture in the cropping sequence help to maintain fertility and tilth. Crops respond well to applications of lime and fertilizer, which help to overcome the low fertility and the high levels of exchangeable aluminum.

Mainly because of the wetness, low strength on sites for roads, the high shrink-swell potential, and the slow permeability, this soil is poorly suited to urban development. It has severe limitations as a site for buildings, local roads and streets, and most sanitary facilities. Excess water can be removed by shallow ditches. It also can be removed by providing the proper grade for drainage. The design of local roads and streets can offset the limited traffic-supporting capacity. The slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. Sewage lagoons or self-contained disposal units can be used to dispose of sewage properly. Properly designing the footings and foundations of buildings helps to prevent the structural damage caused by shrinking and swelling. A drainage system is needed in areas used for most lawn grasses, shade trees, ornamental trees, shrubs, vines, and vegetable gardens.

Mainly because of the wetness and the slow permeability, this soil is poorly suited to recreational development. A good drainage system is needed in most recreation areas.

This soil is well suited to habitat for ducks, deer, rabbits, quail, turkeys, doves, and numerous small furbearers. The habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by propagating desirable plants. Controlled burning in pine forests increases the amount of palatable browse for deer and the number of seed-producing plants available to quail and turkeys.

The capability subclass is IIIw. The woodland ordination symbol is 10W.

St—Stough fine sandy loam. This soil is level and somewhat poorly drained. It is on broad, slightly convex ridges on stream or marine terraces. The soil is subject to rare flooding, which can occur during unusually wet periods, mainly in winter and spring. Areas range from about 20 to 200 acres in size. Slopes are 0 to 1 percent.

Typically, the surface layer is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer is light yellowish brown, mottled fine sandy loam about 3 inches thick. The upper 7 inches of the subsoil is yellowish brown, mottled loam. The next 17 inches is yellowish brown, mottled loam and clay loam. The lower part to a depth of about 60 inches is yellowish brown and light brownish gray sandy clay loam and mottled yellowish brown, light yellowish brown, light brownish gray, and strong brown sandy clay loam.

Included with this soil in mapping are a few small areas of Guyton, Myatt, and Satsuma soils. Guyton and Myatt soils are in depressions and are poorly drained. They are grayish throughout. Satsuma soils are in landscape positions similar to those of the Stough soil. They contain less sand in the subsoil than the Stough soil. Included soils make up about 10 percent of the map unit.

The Stough soil is characterized by low fertility and moderately high levels of exchangeable aluminum 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. A seasonal high water table is about 1.0 to 1.5 feet below the surface from January through April. Plants generally are adversely affected by a shortage of water during dry periods in the summer and fall of most years. The soil dries quickly after rains. The shrink-swell potential is low.

Most of the acreage of this soil is used as woodland. A small acreage is used as pasture, cropland, homesites, or recreation areas.

This soil is well suited to loblolly pine and slash pine. The main concerns in producing and harvesting timber are soil compaction and the equipment limitation caused by wetness. Also, competition from understory plants can be severe. After the trees are harvested, carefully managed reforestation can control competition from undesirable understory plants. Competing vegetation also can be controlled by proper site preparation and by spraying, cutting, or girdling, which can eliminate unwanted weeds, brush, or trees. Planting and harvesting only during dry periods minimizes compaction and the formation of ruts. Conventional methods of harvesting timber cannot be used during rainy periods, generally from January to April.

This soil is well suited to pasture. The main limitations are the wetness and the low fertility. Also, droughtiness can be a problem in late summer and in fall during most years. Suitable pasture plants are bahiagrass, common bermudagrass, improved bermudagrass, white clover, southern winterpeas, vetch, and tall fescue. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Fertilizer and lime are needed if the optimum growth of grasses and legumes is to be achieved.

This soil is moderately well suited to cultivated crops, mainly vegetables. Wetness, low fertility, and potentially toxic levels of exchangeable aluminum are the main limitations. Also, the soil can be somewhat droughty in late summer and in fall. It is friable and can be easily worked; however, the surface layer tends to crust. Proper row arrangement, field ditches, and suitable outlets are needed to remove excess surface water. Returning all crop residue to the soil and including grasses, legumes, or a grass-legume mixture in the cropping sequence help to maintain fertility and tilth. Crops respond well to applications of lime and fertilizer, which help to overcome the low fertility and the moderately high levels of exchangeable aluminum.

Mainly because of the wetness, the moderately slow permeability, and the hazard of flooding, this soil is poorly suited to urban development. A drainage system is needed if roads and building foundations are constructed. Flooding can be controlled by levees. The moderately slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. If flooding is controlled, sewage lagoons or self-contained disposal units can be used to dispose of sewage properly. A drainage system is needed in areas used for most lawn grasses, shade trees, ornamental trees, shrubs, vines, and vegetable gardens. Droughtiness can be a problem in late summer and in fall.

Mainly because of the wetness and the moderately slow permeability, this soil is only moderately well suited to recreational development. Flooding is an additional concern in areas used for campsites. It can be controlled, but major structures, such as levees, are needed. A good drainage system is needed in most recreation areas.

This soil is well suited to habitat for deer, rabbits, quail, turkeys, doves, and numerous nongame birds. The habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by propagating desirable plants. Controlled burning in pine forests increases the amount of palatable browse for deer and the number of seed-producing plants available to quail and turkeys.

The capability subclass is IIw. The woodland ordination symbol is 9W.

Ta—Toula silt loam, 1 to 3 percent slopes. This soil is gently sloping and moderately well drained. It is on ridgetops in the uplands. Areas range from about 20 to 200 acres in size.

Typically, the surface layer is dark grayish brown silt loam about 6 inches thick. The subsoil extends to a depth of about 65 inches. In sequence downward, it is yellowish brown silt loam; strong brown, mottled silty clay loam; yellowish brown, mottled silt loam; and a fragipan of yellowish brown, brownish yellow, and strong brown silt loam. The fragipan is at a depth of about 31 inches.

Included with this soil in mapping are a few small areas of Bude and Calhoun soils. Both of these soils are lower on the landscape than the Toula soil. Bude soils are somewhat poorly drained. They have grayish mottles in the upper part of the subsoil. Calhoun soils are poorly drained. They are grayish throughout. Included soils make up about 10 percent of the map unit.

The Toula soil is characterized by low fertility and high levels of exchangeable aluminum that are potentially toxic to most crops. Permeability is slow in the fragipan. Water runs off the surface at a slow or medium rate. Water is perched above the fragipan. It is at a depth of about 1.5 to 3.0 feet from December through April. Typically, the surface layer dries quickly after rains. The effective rooting depth is limited by the fragipan. Plants can be adversely affected by a shortage of water during dry periods in the summer and fall of some years. The shrink-swell potential is low.

Most areas of this soil are used as woodland or pasture. A few areas are used as cropland, homesites, or extensive recreation areas.

This soil is well suited to loblolly pine and slash pine. Competition from understory plants is moderate. After the trees are harvested, carefully managed reforestation can control competition from undesirable understory plants. Competing vegetation also can be controlled by proper site preparation and by spraying, cutting, or girdling, which can eliminate unwanted weeds, brush, or trees. Planting or harvesting only during dry periods helps to prevent soil compaction.

This soil is well suited to pasture. The main management concerns are the low fertility and a moderate hazard of erosion. Suitable pasture plants are bahiagrass, common bermudagrass, improved bermudagrass, ball clover, crimson clover, arrowleaf clover, and ryegrass. During seedbed preparation, the soil should be tilled on the contour or across the slope if possible. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Fertilizer and lime are needed if the optimum growth of grasses and legumes is to be achieved.

This soil is moderately well suited to cultivated crops, mainly corn, grain sorghum, and vegetables. Low fertility, potentially toxic levels of aluminum, and a moderate hazard of erosion are the main limitations. Measures that can control erosion include early seeding, conservation tillage, and contour farming. The soil is friable and can be easily kept in good tilth. It can be worked throughout a wide range in moisture content. Surface crusting and soil compaction can be minimized by returning all crop residue to the soil and by applying a system of conservation tillage. A cropping system that includes grasses, legumes, or a grass-legume mixture helps to maintain fertility and tilth. Crops respond well to applications of lime and fertilizer, which help to overcome the low fertility and the high levels of exchangeable aluminum.

Mainly because of the low strength on sites for local roads and streets, the slow permeability, and the wetness, this soil is only moderately well suited to urban development. A drainage system should be installed if buildings are constructed. The slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. Sewage lagoons or self-contained disposal units can be used to dispose of sewage properly. Sealing the walls and floor of the lagoons helps to prevent seepage. The design of roads and streets can offset the limited traffic-supporting capacity. Erosion is a hazard on construction sites. Preserving the existing plant cover during construction helps to prevent excessive soil loss. Applying fertilizer, seeding, mulching, and shaping the slopes can help to establish and maintain the plant cover.

Mainly because of the wetness and the slow permeability, this soil is only moderately well suited to recreational development. The slope is a moderate limitation on sites for playgrounds. Erosion and sedimentation can be controlled and the beauty of the area enhanced by maintaining an adequate plant cover. A good drainage system is needed in most recreation areas, such as playgrounds and campsites.

This soil is well suited to habitat for deer, squirrels, rabbits, turkeys, quail, doves, and numerous nongame birds and animals. The habitat can be improved by planting appropriate vegetation, by maintaining the existing plant cover, or by propagating desirable plants. Preserving oaks and other mast-producing trees improves the habitat for deer, squirrels, and turkeys.

The capability subclass is IIe. The woodland ordination symbol is 13A.

Ve—Verdun silt loam. This soil is level and somewhat poorly drained. It is on broad flats on stream or marine terraces. The soil is subject to rare flooding. Areas are irregular in shape and are 10 to 100 acres in size. Slopes are less than 1 percent.

Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The subsurface layer is light brownish gray, mottled silt loam about 8 inches thick. The subsoil extends to a depth of about 60 inches. It is grayish brown, mottled silty clay loam in the upper part; yellowish brown, mottled silty clay loam in the next part; and yellowish brown, mottled silt loam in the lower part. The underlying material to a depth of about 70 inches also is yellowish brown, mottled silt loam.

Included with this soil in mapping are a few small areas of Colyell, Deerford, and Springfield soils. Colyell soils are slightly lower on the landscape than the Verdun soil. They have a clayey subsoil that does not have high concentrations of sodium. Deerford soils are in landscape positions similar to those of the Verdun soil. They do not have high concentrations of sodium in the upper part of the subsoil. Springfield soils are in the lower landscape positions and are poorly drained. They have a clayey subsoil. Included soils make up about 10 percent of the map unit.

The Verdun soil is characterized by low fertility. 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 areas for short periods after heavy rains. A seasonal high water table is about 0.5 to 1.0 foot below the surface from December through April. The concentrations of sodium throughout the subsoil restrict root development and limit the amount of water available to plants. The shrink-swell potential is moderate.

Most of the acreage of this soil is used as woodland. A small acreage is used as pasture or cropland or for urban or recreational development.

Mainly because of the alkalinity and the high content of sodium, this soil is poorly suited to loblolly pine and slash pine. It is better suited to hardwoods. The use of equipment is restricted because of the wetness. The sodium in the soil limits root development and the amount of water available to trees. Also, it can be toxic to plants in areas where it is highly concentrated. Seedling mortality is high. Planting and harvesting only during the drier periods minimizes soil compaction.

This soil is moderately well suited to pasture and poorly suited to cropland. It is better suited to shallow-rooted, salt-tolerant grasses and legumes than to most vegetables and field crops. The effective root zone is restricted by the concentrations of sodium. Wetness and low fertility are additional limitations. Excess surface water can be removed by field ditches and suitable outlets. Suitable pasture plants are common bermudagrass, bahiagrass, white clover, southern winterpeas, and vetch. Proper stocking rates, pasture rotation, and restricted grazing during wet periods help to keep the pasture in good condition. Fertilizer is needed if the optimum growth of grasses, legumes, and crops is to be achieved.

Mainly because of the wetness, low strength on sites for roads, the excess sodium, the very slow permeability, the moderate shrink-swell potential, and the hazard of flooding, this soil is poorly suited to urban development. It has severe limitations as a site for buildings, local roads and streets, and most sanitary facilities. Excess water can be removed by shallow ditches. It also can be removed by providing the proper grade for drainage. Flooding can be controlled by levees. Selection of adapted vegetation for planting is critical in areas used for lawns, shrubs, trees, and vegetable gardens because of the concentrations of sodium in the soil. The design of local roads and streets can offset the limited traffic-supporting capacity. Strengthening the foundations of buildings helps to prevent the structural damage caused by shrinking and swelling of the subsoil. The very slow permeability and the high water table increase the possibility that septic tank absorption fields will fail. In areas where levees have been constructed to control flooding, sewage lagoons or self-contained disposal units can be used to dispose of sewage properly.

Mainly because of the wetness, the very slow permeability, and the excess sodium, this soil is poorly suited to recreational development. Flooding is a hazard in areas used for campsites. A good drainage system is needed in most recreation areas. Flooding can be controlled by levees and water pumps. Maintaining a good plant cover helps to control runoff and erosion.

This soil is only moderately well suited to habitat for ducks, deer, rabbits, quail, turkeys, doves, and small furbearers. The selection of desirable plants for wildlife food and cover is limited because of the high content of sodium in the soil. The habitat for wetland wildlife can be improved by constructing shallow ponds, which provide open water areas for waterfowl and furbearers.

The capability subclass is IVs. The woodland ordination symbol is 7T.

Prime Farmland

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

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to food, feed, forage, fiber, and oilseed crops. It may be cultivated land, pasture, woodland, or other land, but it is not urban and built-up land or water areas. It either is used for food or fiber crops or is available for those crops. The soil qualities, growing season, and moisture supply are those needed for a well managed soil to produce a sustained high yield of crops in an economic manner. Prime farmland produces the highest yields with minimal expenditure of energy and economic resources, and farming it results in the least damage to the environment.

Prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The level of acidity or alkalinity is acceptable. Prime farmland has few or no rocks and is permeable to water and air. It is not excessively erodible or saturated with water for long periods and is not frequently flooded during the growing season. The slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Soil Conservation Service.

A recent trend in land use in some parts of the parish has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The map units in the parish that are considered prime farmland are listed in table 6. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 5. The location is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Some soils that have a seasonal high water table qualify for prime farmland only in areas where this limitation has been overcome by drainage measures. The need for these measures is indicated after the map unit name in table 6. Onsite evaluation is needed to determine whether or not this limitation has been overcome by corrective measures.

Use and Management of the Soils

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

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

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the 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 the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

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

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

Crops and Pasture

John W. Powell, conservation agronomist, Soil Conservation Service, helped prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed Soil Map Units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

In 1982, about 20,000 acres in Livingston Parish was used for crops and pasture. Of this total, about 6,500 acres was used for crops, mainly soybeans and vegetables. More than 13,500 acres was pastured (fig. 3). The trend indicates a continuing decrease in the acreage of cropland and an increase in woodland, pasture, and 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 plants, drainage, and the hazard of flooding. Cropping systems and soil tillage also are an important part of management. Each farm has a unique soil pattern and, therefore, unique management problems. Some principles of farm management apply to specific soils and certain crops. This section, however, presents the general principles of management that can be applied widely to the soils in the parish.

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

Common and improved bermudagrass and Pensacola bahiagrass are the most commonly grown summer perennials. These grasses produce good quality forage. Tall fescue, the main winter perennial

Figure 3.—A pastured area of Guyton silt loam.

grass, grows well only on soils that have a favorable moisture content. All of these grasses respond well to fertilizers, particularly nitrogen.

On acid soils white clover, crimson clover, vetch, and Austrian winterpeas respond well to applications of lime.

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

Grazing the understory native plants in woodland provides additional forage. Forage volume varies with the woodland site, the condition of the native forage, and the density of the timber stand. Most woodland areas are managed mainly for timber. These areas, however, will provide substantial volumes of forage under proper management. Careful management of stocking rates and grazing periods ensures the optimum forage production and maintains an adequate cover of understory plants to control erosion.

Fertilization and liming. The soils of Livingston Parish range from very strongly acid to moderately alkaline to a depth of 20 inches. On most of the soils the contents of organic matter and of available nitrogen are low. More information on soil fertility in the parish is given in the section "Soil Fertility Levels." Soils that are acid in the upper part of the profile generally need lime and a complete fertilizer for crops and pasture plants. The amount of fertilizer needed depends upon the kind of crop to be grown, past cropping history, the level of yield desired, and the kind of soil. Applications should be based on the results of soil tests. Information and instructions on collecting and testing samples can be obtained from the Cooperative Extension Service.

Organic matter content. Organic matter is an important source of nitrogen for crops. It also increases the rate of water intake, reduces surface crusting, reduces the erodibility of soils, and improves tilth. In most of the soils in the parish, organic matter content is low. Several management practices help to maintain the level of organic matter. These include growing crops that produce an extensive root system and an abundance of foliage, leaving plant residue on the surface, adding barnyard manure, and growing perennial grasses and legumes in rotation with other crops.

Soil tillage. Only the tillage needed to prepare a seedbed and to control weeds is appropriate. Excessive tillage destroys soil structure. Minimum tillage and no-till practices help to maintain soil tilth. A compacted layer, generally called a traffic pan or plowpan, sometimes develops just below the plow layer in loamy soils. This can be avoided if the soil is not plowed when the soil is wet or if the depth of plowing is varied. Also, this layer can be broken up by subsoiling or chiseling. The use of tillage implements that stir the surface and leave crop residue in place protects the soil from beating rains. This protection of the soil surface helps to control erosion, reduces runoff and surface crusting, and increases infiltration.

Drainage. On many of the soils in the parish, surface drainage is needed to make them more suitable to crops. In early drainage methods the main ditches, laterals, and surface field ditches were arranged in a complex pattern. More recently, drainage in this parish consisted of land smoothing combined with a minimum of surface drainage ditches. Fields were larger, more uniformly shaped, and more suited to the use of modern, multirow farm machinery. Flooding caused by runoff from higher elevations is a hazard on some soils. Most flooding is of short duration. Levee systems have generally not been developed to protect cropland and pasture from flooding.

Cropping system. A good cropping system includes a legume for nitrogen, a cultivated crop to help control weeds, 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. A crop sequence that keeps the soil covered most of the time also helps to control erosion.

A suitable cropping system varies with the needs of the farmer and the characteristics of the soil. On livestock farms, for example, cropping systems that have higher percentages of pasture than those used on cash-crop farms are generally used. In places soybeans are grown continuously or in rotation with grain sorghum. Grass or legume cover crops are sometimes grown in fall and winter. In places double cropping of wheat and soybeans is becoming more common.

Additional information on erosion control, cropping systems, and drainage practices can be obtained from the local office of the Soil Conservation Service, the Cooperative Extension Service, or the Louisiana Agricultural Experiment Station.

Control of erosion. Erosion is a major hazard on many soils, especially on stream terraces and uplands. Erosion generally is not a serious hazard on the mainly level soils on alluvial plains. If the gently sloping soils, such as Olivier and Toula soils, are left without plant cover for extended periods, erosion is a hazard. Erosion is commonly a hazard in fallow-plowed fields and in newly constructed drainage ditches. Maintaining a plant cover on the soil, returning all crop residue to the soil, farming on the contour, stripcropping, and using conservation tillage will help to control erosion. Also, seeding grass in drainage ditches immediately after construction helps to control erosion. Gully erosion control structures are needed in some drainage ditches.

Yields Per Acre

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

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

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

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

Crops other than those shown in table 7 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils 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 criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey.

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 hazard is the 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, woodland, wildlife habitat, or recreation.

The capability classification of each map unit is given in the section "Detailed Soil Map Units" and in the yields table.

Woodland Management and Productivity

Carl V. Thompson, Jr., state staff forester, Soil Conservation Service, helped prepare this section.

This section provides information on the kind, amount, and condition of woodland resources in Livingston Parish as well as soil interpretations that can be used in planning.

Soil directly influences the growth, management, harvesting, and multiple uses of forests. It is the medium in which a tree is anchored and from which it draws its nutrients and moisture. Soil characteristics, such as chemical composition, texture, structure, depth, and slope position affect tree growth, seedling survival, species adaptability, and equipment limitations.

The ability of a soil to supply moisture and nutrients to trees is strongly related to its texture, structure, and depth. Generally, sandy soils are less fertile and lower in water-holding capacity than loamy and clayey soils. However, aeration is often impeded in clayey soils, particularly under wet conditions.

These soil characteristics, in combination, largely determine the forest stand species composition and influence decisions of management and use. Sweetgum, for example, is tolerant of many soils and sites but grows best on the rich, moist, alluvial loamy soils of bottom land. Use of heavy logging and site-preparation equipment is more restricted on wet, clayey soils than on better drained, sandy or loamy soils. Harvesting some sites during wet periods can severely compact the soils and damage the roots of the residual stand of trees. This harvesting thus increases soil erosion and reduces soil productivity.

Woodland Resources

The topography and woodlands of Livingston Parish vary from the gently sloping, piney woods in the north to the level, hardwood swamps along Lake Maurepas, the Blind River, and the Amite River in the south. The forest species that dominate are longleaf pine, slash pine, and loblolly pine on the higher sites; sweetgum, red oak, white oak, American elm, pecan, green ash, American sycamore, and eastern cottonwood on the bottom land; and baldcypress and water tupelo in the swamps.

The piney woods area in the northern part of the parish was once a vast virgin forest. At the turn of the century, this forest was clearcut and the soils were essentially left barren of commercial trees. This area did not become a productive commercial forest again until the late 1940's and early 1950's. Reforestation was possible through the Louisiana Office of Forestry (then known as the Louisiana Forestry Commission), which provided effective fire protection and produced millions of pine seedlings for planting the cut-over areas. As a result, timber and land values began to increase and landowners began to bring their property into production. Most of Livingston Parish that was once forested is again used for growing pine trees. A smaller part of the parish is used as urban land, pasture, and cropland or is in other nonforest uses.

In Livingston Parish about 343,200 acres, or about 81 percent of the total land area, is commercial woodland *(36)*. Commercial woodland is defined as land that produces crops of industrial wood and that is not withdrawn from timber use.

Between 1974 and 1980, 8,700 acres of commercial woodland was taken out of production; from 1980 to 1984, another 1,500 acres was converted to other uses. Most of this woodland was converted to urban land, electrical power transmission or transportation corridors, and pasture. Woodland will be converted to other uses at an accelerated rate as urban expansion continues.

Forest industries own about 52 percent of the commercial forests; corporations, 19 percent; and miscellaneous private concerns, 22 percent. About 5 percent is on private farms, and about 2 percent is public forest land.

The land in the parish is divided into three major land resource areas, or MLRA's: Eastern Gulf Coast Flatwoods, Southern Mississippi Valley Silty Uplands, and Southern Mississippi Valley Alluvium. The Eastern Gulf Coast Flatwoods MLRA and the Southern Mississippi Valley Silty Uplands MLRA support the most important commercial forests in the parish. The dominant trees are loblolly pine, slash pine, longleaf pine, sweetgum, water oak, southern red oak, white oak, American sycamore, and magnolia on the higher, well drained soils in these two MLRA's and eastern cottonwood, green ash, white oak, cherrybark oak, Nuttall oak, water oak, willow oak, overcup oak, American sycamore, and water tupelo on the lower, poorly drained sites. In the Southern Mississippi Valley Alluvium MLRA, the dominant trees are sweetgum, slash pine, loblolly pine, water oak, southern red oak, white oak, blackgum, and green ash on the higher, better drained soils and green ash, white oak, cherrybark oak, Nuttall oak, water oak, willow oak, baldcypress, American sycamore, and water tupelo on the lower, poorly drained sites.

The forest types in commercial forests are based either on tree species, site quality, or age. In this survey, the forest types are named for the dominant trees growing in the tree stand. The stands are similar in character, composed of the same species, and growing under the same ecological and biological conditions.

The loblolly-shortleaf pine forest type comprises 41 percent of the forest land in the parish. About 5 percent of the trees are planted, and 36 percent are naturally regenerated. Loblolly pine is generally dominant on sites that are not dry. On well drained soils, scattered hardwoods, such as sweetgum, blackgum, southern red oak, post oak, white oak, mockernut hickory, and pignut hickory, are mixed with the pines. On some of the more moist sites, sweetgum, red maple, water oak, and willow oak are mixed with the pines. American beech and green ash are associated with this forest type in fertile, well drained coves and along stream bottoms.

The oak-gum-cypress forest type comprises 30 percent of the forest land in the parish. This type consists of bottom land forests of water tupelo, blackgum, sweetgum, oak, and baldcypress, singly or in combination. Trees associated with this type include cottonwood, black willow, ash, hackberry, maple, and elm.

The oak-pine forest type comprises 15 percent of the forest land. About 50 to 75 percent of the stands is hardwoods, generally upland oaks, and 25 to 50 percent is softwoods (baldcypress is not included). The species that comprise the oak-pine type are primarily determined by the soil, slope, and aspect. On the higher, drier sites, the hardwood components tend to be upland oaks, such as post oak, southern red oak, and blackjack oak. On the more moist and fertile sites, white oak, southern red oak, and black oak are dominant. Blackgum, winged elm, red maple, and various hickories are associated with the oak-pine type on both of these broad sites.

The oak-hickory forest type comprises 14 percent of the forest land in the parish. Upland oaks or hickory, singly or in combination, dominate the stands. Elm and maple are commonly associated with this forest type.

The marketable timber volume consists of about 50 percent pine and 41 percent hardwood (fig. 4). About 56 percent of the forest acreage is sawtimber, 24 percent is poletimber, and 17 percent is saplings and seedlings. About 12 percent of the forest land produces 165 cubic feet or more of wood per acre, 41 percent produces 120 to 165 cubic feet per acre, 22 percent produces 85 to 120 cubic feet per acre, and 25 percent produces 50 to 85 cubic feet per acre.

Timber production is important to the economy of the parish. Forest industries own most of the upland pine sites. These upland pine forests are generally well managed. In places, however, heavy cutting, improper harvesting, and inadequate regeneration have damaged sites and reduced the amount of growing stock. The small, privately owned tracts and most of the bottomland tracts are producing well below potential. Thinning out mature trees and undesirable species in stands will benefit most of these tracts. Protecting the stands from grazing, fire, insects, and diseases and planting trees will also improve the stands.

Environmental Impact

The Soil Conservation Service, the Louisiana Office of Forestry, or the Louisiana Cooperative Extension Service can help determine specific woodland management needs.

Woodlands also provide wildlife habitat, recreation, and natural beauty and are vital to soil and water conservation efforts. The commercial forest land of Livingston Parish provides food and shelter for wildlife and offers opportunities for sport and recreation to many users each year. Hunting and fishing clubs lease or otherwise use the forest lands. Forest land provides watershed protection, helps to control soil erosion, reduces sedimentation, and enhances the quality and value of water resources.

Trees can be planted to screen distracting views of dumps and other unsightly areas, muffle the sound of traffic, reduce the velocity of winds, and lend beauty to the landscape. They produce fruits and nuts, which people as well as wildlife can use. Trees and forests help filter out airborne impurities, help convert carbon dioxide into oxygen, and provide shade.

Production of Forage in Woodland

The kind and amount of understory vegetation are related to the soils, climate, and amount of tree overstory in a particular area. Many pine woodlands can be used for cattle grazing, but grazing of hardwood forests is not recommended. If proper management is applied, the understory of grasses, legumes, forbs, and many woody browse species are grazeable without damage to the wood crop. In most areas of pine woodland, grazing reduces the amount of accumulated rough and thus helps to prevent wildfires. It also suppresses undesirable woody plants.

The effectiveness of a combined woodland and livestock program depends primarily on the degree and time of grazing of the forage plants. Controlled grazing helps to maintain a protective cover for the soil and maintains or improves the quantity and quality of trees and forage vegetation.

Forage production varies with the type of woodland and the amount of sunlight that reaches the understory vegetation during the growing season. Groups of soils that have the same potential for producing trees will also have the same potential for producing about the same kinds and amounts of understory vegetation. The vegetative community on these soils will reproduce itself as long as the environment does not change.

The total potential yields of grasses, legumes, and forbs on similar soils is closely related to the amount of sunlight reaching the ground in the forest at midday. As the forest canopy becomes denser, herbage production consequently declines.

Proper grazing management that keeps the woodland forage in excellent or good condition will conserve water, improve yields, and protect the soils.

Table 8 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination 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,

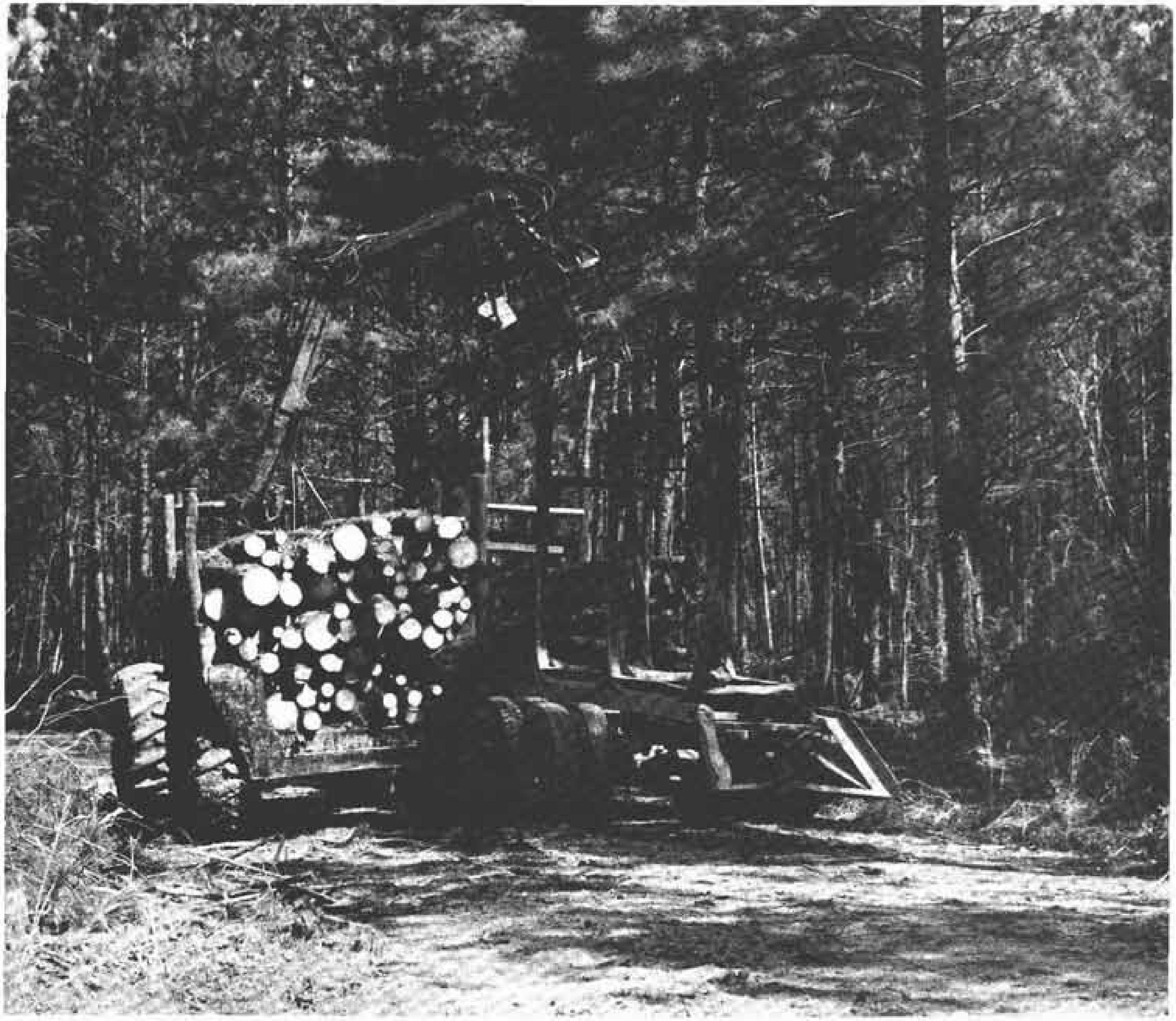

Figure 4.—A pine forest in an area of Satsuma silt loam, 1 to 3 percent slopes. Pine forests provide a majority of the marketable timber in Livingston Parish.

indicates the potential productivity of the soils for an indicator tree species. The number indicates the *volume, in cubic meters per hectare per year,* which the indicator species can produce. The number 1 indicates low potential productivity; 2 and 3, moderate; 4 and 5, moderately high; 6 to 8, high; 9 to 11, very high; and 12 to 39, extremely high. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *R* indicates steep slopes; *X*, stoniness or rockiness; *W*, excess water in or on the soil; *T*, toxic substances in the soil; *D*, restricted rooting depth; *C*, clay in the upper part of the soil; *S*, sandy texture; and *F*, a high content of rock fragments in the soil. The letter *A* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, and F.

In table 8, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that damage will occur as a result of site preparation and cutting where the soil is exposed along roads, skid trails, fire lanes, and log-handling areas. Forests that have been burned or overgrazed are also subject to erosion. Ratings of the erosion hazard are based on the percent of the slope. A rating of *slight* indicates that no particular prevention measures are needed under ordinary conditions. A rating of *moderate* indicates that erosion-control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that under normal conditions the kind of equipment or season of use is not significantly restricted by soil factors. Soil wetness can restrict equipment use, but the wet period does not exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If the soil is wet, the wetness restricts equipment use for a period of 1 to 3 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment that can be used or the season of use. If the soil is wet, the wetness restricts equipment use for more than 3 months.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. A rating of *slight* indicates that seedling mortality is not likely to be a problem under normal conditions. Expected mortality is less than 25 percent. A rating of *moderate* indicates that some problems from seedling mortality can be expected. Extra precautions are advisable. Expected mortality is 25 to 50 percent. A rating of *severe* indicates that seedling mortality is a serious problem. Extra precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent.

Plant competition ratings indicate the degree to which undesirable species are expected to invade and grow when openings are made in the tree canopy. The main factors that affect plant competition are the depth to the water table and the available water capacity. A rating of *slight* indicates that competition from undesirable plants is not likely to prevent natural regeneration or suppress the more desirable species. Planted seedlings can become established without undue competition. A rating of *moderate* indicates that competition may delay the establishment of desirable species. Competition may hamper stand development, but it will not prevent the eventual development of fully stocked stands. A rating of *severe* indicates that competition can be expected to prevent regeneration unless precautionary measures are applied.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index* and as a *productivity class*. The site index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. In this survey, the productivity of the soils is based on age 30 years for eastern cottonwood, 35 years for American sycamore, and 50 years for all other species *(9, 10, 11, 39)*. 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.

The *productivity class*, a number, is the yield likely to be produced by the most important trees. This number, expressed as cubic meters per hectare per year, indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand. Cubic meters per hectare can be converted to cubic feet per acre by multiplying by 14.3. Cubic feet can be converted to board feet by multiplying by a factor of about 5. For example, a productivity class of 8 means the soil can be expected to produce 114 cubic feet per acre per year at the point where mean annual increment culminates, or about 570 board feet per acre per year.

The first species listed under *common trees* for a soil is the indicator species for that soil. It is the dominant species on the soil and the one that determines the ordination class.

Trees to plant are those that are suitable for commercial wood production.

Recreation

In table 9, the soils of the survey area are rated 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 sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 9, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 9 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

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

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

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

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

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

Wildlife Habitat

Billy R. Craft, state staff biologist, Soil Conservation Service, helped prepare this section.

Livingston Parish is predominantly forested and provides habitat for a large population of woodland wildlife. Smaller acreages of open agricultural land, lakes, and streams support varied populations of fish and wildlife. The expansion of urban areas, such as Baton Rouge and New Orleans, has accelerated, mainly in the woodland along Interstate 12. Urban expansion has also occurred to some extent in other parts of the parish. This expansion has had an important effect on wildlife habitat.

In rural areas hunting and outdoorsmanship are proud traditions. Until recently, most areas of the parish placed very few restrictions on hunting. The area is popular with hunters from nearby Baton Rouge and New Orleans. Currently, however, many areas are legally posted and are no longer open to hunting by the public.

The pine forest, the most common type of wildlife habitat in Livingston Parish, provides low- or medium-quality habitat for white-tailed deer, squirrel, rabbit, and wild turkey. Periodic thinning of the stands and prescribed burning will benefit woodland wildlife. The large holdings of commercial timber companies are managed mainly for an even-aged, single species of pine. Under this type of management, these forests can provide only low-quality habitat for most woodland wildlife. When they are near stands of hardwoods, however, these intensively managed pine forests provide cover for wildlife, such as wild turkey and white-tailed deer.

Most hardwood forests in the parish are on the bottom land along major streams, such as the Tickfaw River. These hardwood forests provide excellent habitat for forest wildlife. Typical hardwood species are water oak, green ash, white oak, overcup oak, red maple, hickory, elm, water tupelo, baldcypress, cherrybark oak, southern magnolia, sweetbay, persimmon, and blackgum.

A large swamp in the southern part of the parish near Lake Maurepas supports dominantly baldcypress, water tupelo, red maple, and green ash (fig. 5). It also supports such shrubs as water elm and buttonbush. Inundated most of the time, swamps provide excellent habitat for wood ducks, wading birds, amphibians, and reptiles. They also are important for wood production, ground water recharge, and water quality improvement. Swamps are also used as hunting grounds and for trapping.

On the small acreages of cropland and pasture, bermudagrass, bahiagrass, Dallisgrass, and coastal bermudagrass are common pasture grasses. Pastures can be moderately grazed or clipped and thus provide brooding areas for wild turkeys. Pasture and cropland provide food and cover for mourning doves, bobwhite quail, rabbits, and many nongame birds and animals.

Fishing is available at many private farm ponds, creeks, rivers, and lakes in Livingston Parish. The most common species are bluegill, largemouth bass, redear sunfish, warmouth, white bass, spotted bass, channel catfish, and blue catfish. Most of the streams in the parish are clear and pretty and provide opportunities for float fishing and other outdoor activities. Most of the farm ponds are stocked with bluegill, redear sunfish, and largemouth bass. A few are stocked with channel catfish.

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

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

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

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

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

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, bermudagrass, bahiagrass, clover, and vetch.

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

Figure 5.—Baldcypress and water tupelo in an area of Maurepas muck. This soil provides habitat for many species of wetland wildlife.

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, available water capacity, and wetness. Examples of these plants are oak, poplar, sweetgum, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are hawthorn, persimmon, and sumac.

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, salinity, and soil moisture. Examples of shrubs are American beautyberry, American elder, and deciduous holly.

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

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

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

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. 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, herons, shore birds, muskrat, mink, nutria, 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, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

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

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

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

Building Site Development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings 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 graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

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

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

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

Sanitary Facilities

Table 12 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 12 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

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

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to 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 12 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 12 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

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

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

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. These soils may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

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

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for embankments, dikes, and levees and for aquifer-fed excavated ponds. 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.

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

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

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

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of soil blowing or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of soil blowing, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

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

Texture is given in the standard terms used by the U.S. Department of Agriculture. 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 about 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 *(3)* and the system adopted by the American Association of State Highway and Transportation Officials *(2)*.

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, CL-ML.

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.

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 generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at ⅓ bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

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

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 16, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 17 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the infiltration 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 covering of the soil surface by flowing water, is caused by overflowing streams, by runoff from adjacent slopes, or inflow from high tides. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding. Standing water in swamps and marshes or in a closed depression is considered ponding.

Table 17 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, or frequent. *None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (there is a near 0 to 5 percent chance of flooding in any year). *Occasional* means that flooding occurs frequently under normal conditions (there is a 5 to 50 percent chance of flooding in any year). *Frequent* means that flooding occurs often under normal weather conditions (there is more than a 50 percent chance of flooding in any year). Duration is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* (more than 1 month). The time of year that floods are most likely to occur is expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 17 are the depth to the seasonal high water table; the kind of water table—that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 17.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

The two numbers in the "High water table—Depth" column indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. Table 17 shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which usually is a result of oxidation.

Not shown in the table is subsidence caused by an imposed surface load or by the withdrawal of ground water throughout an extensive area as a result of lowering the water table.

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.

Soil Fertility Levels

Dr. M.C. Amacher, Department of Agronomy, Louisiana State University, helped prepare this section.

Factors Affecting Crop Production

Crop composition and yield function with many soil, plant, and environmental factors. This section gives a brief description of the more important factors.

Environmental factors. The main environmental factors are intensity and duration of light, temperature of air and soil, distribution and amount of precipitation, and atmospheric carbon dioxide concentration.

Plant factors. These factors are species and hybrid specific. They include the rate of nutrient and water uptake and the rate of growth and related plant functions.

Soil factors. These factors include both physical and chemical properties of the soils.

Physical properties. These are particle-size distribution, texture, structure, surface area, bulk density, water retention and flow, and aeration.

Chemical properties (soil fertility factors). The quantity of the chemical element, its intensity, its relative intensity, the relationship of quantity and intensity, and the rate of replenishment of the elements to the soils are the factors of chemical properties. They affect crop growth.

•Quantity factor. Plants take up this amount of a readily available element out of the soil. The quantity factor is called the available supply of an element. Using a suitable extractant to remove the quantity factor from the soil and then analyzing it will determine the available supply.

•Intensity factor. The intensity factor is related to the concentration of an element species in the soil water. It is a measure of the availability of an element that plant roots can take up. If two soils have identical quantities of an element's available supply but have different element intensity factors, the element availability to the plant will differ.

•Relative intensity factor. This refers to the effect that the availability of one element has on the availability of another element.

•Quantity/intensity relationship factor. These relationships include the reactions between the surface and soil water that control the distribution of element species between the available supply in the soil and the soil water. A special type of quantity/intensity relationship is the buffer capacity of the soil for a given element. The buffer capacity is the amount of a given element that must be added to or removed from the available supply to produce a given change in the intensity factor for that element.

•Replenishment factor. This is the rate of replenishment of the available supply and intensity factors by weathering reactions, fertilizer additions, and transport by mass flow and diffusion.

These factors are interdependent. The magnitude of the factors and the interactions among them will control crop response. The relative importance of each factor changes with the soil, crop, and environment. The soil factors are only part of the overall system.

Soil testing provides information for a soil and crop management program that establishes and maintains optimum levels and balance of the essential elements in the soil. Soil testing provides for crop and animal nutrition and protects the environment against the buildup of potentially toxic levels of essential and nonessential elements. Current soil tests measure only one soil factor, the available supply of nutrients in the surface layer or plow layer. If the availability of one or more nutrients in the plow layer clearly limits crop production, existing soil tests can generally diagnose the problem and suggest reliable recommendations. Soil management systems are generally based on the physical and chemical alteration of the plow layer. Characteristics of this layer can vary from one location to another, depending on management practices and soil use.

Alteration of the plow layer produces little change in the subsurface layers or changes them very slowly. The properties of the subsoil reflect the soil's inherent ability to supply nutrients to plant roots and to provide a favorable environment for root growth. Following soil fertility recommendations based on current soil tests will normally correct major fertility problems in the plow layer. Other limitations for crop production are crop and environment factors, physical properties of the plow layer, and physical and chemical properties of the subsoil.

The soil's available nutrient supply is an important factor affecting crop production. Information on the available nutrient supply in the subsoil helps in the evaluation of the native fertility levels of the soil.

Soil profiles were sampled during the soil survey and analyzed for reaction (pH); organic matter; extractable phosphorus; exchangeable calcium, magnesium, potassium, sodium, aluminum, and hydrogen; total acidity; and cation-exchange capacity. These results are summarized in table 18 and are discussed in the following sections, where subsoil properties are emphasized. More detailed information on the chemical analysis of soils is available *(1, 6, 8, 22, 23, 24, 27, 28, 33, 34, 38, 41)*.

Chemical Analysis Methods

The methods used to obtain the data are listed below. The codes in parentheses refer to published methods *(35)*.

Reaction (pH)—1:1 soil-water solution (8C1a).

Organic carbon—dichromate, ferric sulfate titraton (6A1a).

Extractable phosphorus—(Bray No. 2).

Exchangeable cations—ammonium acetate pH 7.0, uncorrected; calcium (6N2), magnesium (6O2), potassium (6Q2), sodium (6P2).

Exchangeable aluminum and hydrogen—potassium chloride extraction (6G2).

Total acidity—barium chloride-triathanolamine 1 (6H1a).

Effective cation-exchange capacity—sum of cations plus exchangeable aluminum and hydrogen (5A3b).

Sum cation-exchange capacity—sum of cations plus total acidity (5A3a).

Base saturation—sum of cations divided by the sum cation-exchange capacity (5C3).

Exchangeable sodium percentage—exchangeable sodium divided by the cation-exchange capacity.

Aluminum saturation—exchangeable aluminum divided by the effective cation-exchange capacity.

Characteristics of Soil Profile Fertility

In terms of soil fertility, four major types of soils are in the survey area. The first type includes soils that have relatively high levels of available nutrients throughout the profile. Nutrient levels are high because these soils formed in parent material with relatively high fertility. Also, the soils are relatively young and thus have been less intensively weathered.

The second type of soil profile has relatively low levels of available nutrients in the surface layer. The nutrient levels generally increase with depth of the profile. These soils formed in parent material that was relatively fertile, but they are older than the soils in the first group and thus have been weathering longer and more intensively. Early in the growing season, crops growing on this type of soil may exhibit deficiency symptoms. If the crop roots can penetrate the more fertile subsoil horizons as the growing season progresses, the deficiency symptoms may disappear.

The third type of soil profile has adequate or relatively high levels of available nutrients in the surface layer and relatively low levels in the subsoil. Either the parent material of these soils was low in fertility, or these older soils have been weathering longer and more intensively than those in the first two groups. Generally, the levels of nutrients in the surface layer are high because of additions of fertilizer on soils that have been farmed or because of a natural biocycling on undisturbed soils.

The fourth type of soil has relatively low levels of available nutrients throughout the profile. These soils formed in parent material that was low in fertility, or they have been intensively weathered for a long time. No additions of fertilizer have been applied, nor has biocycling taken place in these soils.

Other soil properties, such as reaction and acidity, can also be distributed in the same patterns as those described above. These patterns result from the interactions of parent material, weathering (climate), time, and, to a lesser extent, living organisms and topography.

Nitrogen. Generally, more than 90 percent of the nitrogen in the surface layer is organic nitrogen. In many areas most of the nitrogen in the subsoil is fixed ammonium nitrate. Although these forms of nitrogen are unavailable for plant uptake, they can be converted to species of readily available ammonium and nitrate.

Nitrogen is generally the most limiting nutrient element in crop production, and plants demand much of it. Applications of nitrogen fertilizer are nearly always based on the nitrogen requirement of the crop rather than on soil tests, because reliable soil tests for nitrogen are not available. The status of nitrogen fertility in the soil can be estimated from the amount of readily available ammonium and nitrate, the amount of organic nitrogen, the rate of mineralization of organic nitrogen into available forms of nitrogen, and the rate of conversion of fixed ammonium nitrate to available forms of nitrogen.

Because the amounts and rates of transformation of the various forms of nitrogen in the soils in Livingston Parish are unknown, the nitrogen content cannot be assessed.

Phosphorus. Phosphorus is in the soil as discrete solid phase minerals, such as hydroxyapatite, variscite, and strengite; as occluded or coprecipitated phosphorus in other minerals; as retained phosphorus on mineral surfaces, such as carbonates, metal oxides, and layer silicates; and in organic compounds. The availability of phosphorus in the soil is an important factor in controlling the amount of phosphorus that plants take up. Most phosphorus is unavailable for plant uptake.

Bray 2 extracts more phosphorus than the more commonly used extractants, such as Bray 1, Mehlich I, and Olsen. These extractants are used in estimating the supply of available phosphorus in the soil. The content of Bray 2 extractable phosphorus in all the soils in Livingston Parish is low or very low, according to guidelines for soil test interpretations. Continual additions of phosphorus fertilizer are needed to build up and maintain adequate levels of available phosphorus for optimum crop production.

Potassium. There are three major forms of potassium in soils. These are exchangeable potassium associated with negatively charged sites on clay mineral surfaces, nonexchangeable potassium trapped between clay mineral interlayers, and structural potassium within the crystal lattice of minerals. The exchangeable form of potassium in soils can be replaced by other cations, and thus generally is readily available for plant uptake. To become available, the other forms of potassium must be converted to the exchangeable forms by weathering reactions.

The exchangeable potassium content of the soils is an estimate of the supply of available potassium. According to guidelines for soil test interpretations, the supply of available potassium is low or very low in the soils in Livingston Parish. This limited supply indicates a general lack of micaceous minerals, which are a source of exchangeable potassium during the process of weathering. Crops respond well to applications of potassium fertilizer on soils that have low or very low levels of exchangeable potassium. On soils that have a sufficient amount of clay to hold the potassium, these levels can be gradually raised by additions of potassium. Exchangeable potassium levels can be maintained by adding enough potassium to compensate for the amount removed by crops, for fixation of exchangeable potassium to nonexchangeable potassium, and for leaching losses.

Magnesium. Magnesium in soils occurs as exchangeable magnesium associated with negatively charged sites on clay mineral surfaces and as structural magnesium in mineral crystal lattices. Exchangeable magnesium is generally readily available for plant uptake, but structural magnesium must be converted to exchangeable magnesium by mineral weathering reactions.

According to guidelines for soil test interpretations, the content of exchangeable magnesium in the soils in Livingston Parish ranges from low to high. Generally, the content increases with increasing depth. The level of exchangeable magnesium in most soils in the parish is adequate for crop production, and magnesium deficiencies in plants are rare. Thus, additions of magnesium fertilizer are not needed.

Calcium. Calcium in the soils occurs as exchangeable calcium associated with negatively charged sites on clay mineral surfaces and as structural calcium in mineral crystal lattices. Exchangeable calcium generally is available for plant uptake, whereas structural calcium is not readily available.

The effective cation-exchange capacity is the sum of exchangeable cations (calcium, magnesium, potassium, and sodium). It is determined by extraction with pH 7, 1 molar ammonium acetate plus the sum of neutral salt exchangeable aluminum and hydrogen (exchangeable acidity). The sum cation-exchange capacity is the sum of exchangeable bases plus the total acidity determined by extraction with pH 8.2, barium chloride-triethanolamine. The effective cation-exchange capacity generally is less than the sum cation-exchange capacity and includes only that part of the pH-dependent cation-exchange capacity determined by exchange of hydrogen with neutral salt. The sum cation-exchange capacity includes all of the pH-dependent cation-exchange capacity up to pH 8.2. If a soil has no pH-dependent exchange sites or the soil pH is about 8.2, the effective capacity and the sum capacity will be about the same. The larger the cation-exchange capacity, the larger the capacity to store nutrient cations. The sum cation-exchange capacity of the soils in Livingston Parish is generally much greater than the effective cation-exchange capacity. This imbalance shows that most of the cation-exchange capacity is pH-dependent.

Physical and Chemical Analyses of Selected Soils

The results of physical analysis of several typical pedons in the survey area are given in table 19 and the results of chemical analysis in table 20. The data are for soils sampled at carefully selected sites. Most of the pedons are typical of the series and are described in the section "Soil Series and Their Morphology." Some pedons are not typical of the series, but they are similar to the typical pedon. Soil samples were analyzed 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 ovendry basis. The methods used in obtaining the data are indicated in the list that follows. The codes in parentheses refer to published methods *(38)*.

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 ovendry weight of less than 2 mm material; ⅓ or ¹⁄₁₀ (³⁄₁₀) bar (4B1), 15 bars (4B2).

Water-retention difference—between ⅓ bar and 15 bars for less than 2 mm material (4C1).

Field moist bulk density—of less than 2 mm material, saran-coated clods (4A3A); air-dry (4AA1) and ovendry (4A1R).

Organic matter—dichromate, ferric sulfate titration (6A1a); percent organic carbon multiplied by 1.7 equals percent organic matter.

Extractable cations—ammonium acetate pH 7.0, uncorrected; calcium (6N2), magnesium (6O2), sodium (6P2), potassium (6Q2).

Cation-exchange capacity—ammonium acetate, pH 7.0 (5A1a).

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 Bray No. 2).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(37)*. 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 21 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Entisol.

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

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hydraquents (*Hydr*, meaning presence of water, plus *aquent*, the suborder of the Entisols that has an aquic moisture regime).

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

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, 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 very fine, montmorillonitic, nonacid, thermic Typic Hydraquents.

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 (35)*. Many of the technical terms used in the descriptions are defined in *Soil Taxonomy (37)*. 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."

Abita Series

The Abita series consists of somewhat poorly drained, slowly permeable soils that formed in silty and loamy sediments. These soils are on low, broad stream or marine terraces of late Pleistocene age. Slopes range from 1 to 3 percent.

Soils of the Abita series are fine-silty, siliceous, thermic Glossaquic Paleudalfs.

Abita soils commonly are near Cahaba, Guyton, Myatt, Satsuma, and Stough soils. Cahaba soils are higher on the landscape than the Abita soils and are well drained. They are fine-loamy. Guyton and Myatt soils are in the lower landscape positions and are poorly drained. They are grayish throughout. Also, Myatt soils are fine-loamy. Satsuma and Stough soils are in landscape positions similar to those of the Abita soils. The argillic horizon in Satsuma soils is not so thick as that in the Abita soil. Stough soils are coarse-loamy.

Typical pedon of Abita silt loam, 1 to 3 percent slopes; 0.75 mile southeast of Albany, 5,500 feet north of Interstate 12, and 2,100 feet east of the Natalbany River; Spanish Land Grant sec. 37, T. 7 S., R. 6 E.

A—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable; many medium and fine roots; very strongly acid; clear wavy boundary.

E—4 to 9 inches; pale brown (10YR 6/3) silt loam; weak fine granular structure; friable; many medium and fine roots; very strongly acid; clear wavy boundary.

B/E—9 to 18 inches; yellowish brown (10YR 5/4) silt loam (Bt); weak medium subangular blocky structure; friable; many fine roots; few faint clay films on faces of peds; about 20 percent vertical seams of light brownish gray (10YR 6/2) silt loam (E) about 2 to 5 centimeters wide between peds; very strongly acid; clear wavy boundary.

Bt—18 to 35 inches; yellowish brown (10YR 5/4) silty clay loam; common medium distinct light brownish gray (10YR 6/2) and common medium prominent red (2.5YR 4/8) mottles; moderate medium subangular blocky structure; firm; few fine roots; common distinct clay films on faces of peds; few fine brown and black concretions; strongly acid; clear wavy boundary.

Btg1—35 to 50 inches; light brownish gray (10YR 6/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; common distinct clay films on faces of peds; few fine black and brown concretions; strongly acid; gradual wavy boundary.

Btg2—50 to 60 inches; light brownish gray (2.5Y 6/2) silty clay loam; common coarse yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; firm; common distinct clay films on faces of peds; few fine black concretions; neutral.

The thickness of the solum ranges from 60 to more than 80 inches. Grayish mottles caused by wetness are within 30 inches of the surface. In the upper 30 inches, at least 50 percent of the effective cation-exchange capacity is occupied by exchangeable aluminum.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 3. It ranges from extremely acid to neutral.

The E horizon and the E part of the B/E horizon have hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 to 3. They are silt loam or very fine sandy loam. They range from extremely acid to slightly acid. Some pedons have a BA horizon or a BE horizon. These horizons have hue of 7.5YR, 10YR, or 2.5Y, value of 4 to 6, and chroma of 3 to 6. They have few to many mottles in shades of gray, yellow, or red. They are silt loam or silty clay loam. They range from very strongly acid to neutral.

The Bt part of the B/E horizon and the Bt horizon have hue of 7.5YR, 10YR, or 2.5Y, value of 4 to 6, and chroma of 3 to 8, or they are mottled in shades of brown, gray, or red. They have few to many mottles in shades of gray. They are silt loam or silty clay loam. They range from very strongly acid to slightly acid.

The Btg horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 1 or 2. It is silty clay loam, clay loam, or loam. It ranges from strongly acid to slightly acid in the upper part and from strongly acid to mildly alkaline in the lower part.

Barbary Series

The Barbary series consists of very poorly drained, very slowly permeable soils. These soils formed in recent, very fluid, clayey sediments that were deposited in water and have never air dried. The soils are in low, broad backswamps. They are continuously saturated and are nearly continuously ponded. Slopes are less than 1 percent.

Soils of the Barbary series are very fine, montmorillonitic, nonacid, thermic Typic Hydraquents.

Barbary soils commonly are near Maurepas soils. Maurepas soils are at the slightly lower elevations. They have thick organic layers that contain decomposed woody material.

Typical pedon of Barbary muck; 1 mile south of Louisiana Highway 1039, 1,800 feet north of Bayou

Chene Blanc, and 400 feet east of Black Bayou; sec. 19, T. 9 S., R. 6 E.

Oa—0 to 6 inches; very dark grayish brown (10YR 3/2) muck, same color pressed and rubbed; massive; about 30 percent fiber, less than 10 percent rubbed; very fluid (flows easily between fingers when squeezed, leaving hand empty); slightly acid; clear smooth boundary.

Cg1—6 to 35 inches; gray (5Y 5/1) clay; few fine distinct olive (5Y 4/3) mottles; massive; very fluid (flows easily between fingers when squeezed, leaving small residue in hand); about 5 percent organic matter; neutral; clear smooth boundary.

Cg2—35 to 52 inches; gray (N 5/0) clay; massive; very fluid (flows easily through fingers when squeezed, leaving small residue in hand); common small to large fragments of wood; about 5 percent organic matter; mildly alkaline; clear smooth boundary.

Cg3—52 to 65 inches; gray (N 6/0) clay; massive; very fluid (flows easily through fingers when squeezed, leaving small residue in hand); few large fragments of wood; neutral.

The n values are greater than 0.7 in all horizons to a depth of 40 inches or more. In some pedons organic horizons below a depth of 50 inches have logs, stumps, and wood fragments.

The Oa horizon has hue of 10YR, 7.5YR, or 5YR, value of 2 or 3, and chroma of 1 or 2. It is 2 to 8 inches thick. It ranges from medium acid to mildly alkaline.

Some pedons have an A horizon. This horizon has hue of 10YR, 2.5Y, or 5Y, value of 3 to 5, and chroma of 1 or 2. It is very fluid clay or mucky clay. It is neutral or mildly alkaline.

The Cg horizon has hue of 10YR, 2.5Y, 5Y, or 5BG, value of 4 or 5, and chroma of 1, or it is neutral in hue and has value of 4 to 6. It is very fluid clay or mucky clay. It ranges from neutral to moderately alkaline. It has stumps and logs in some pedons.

Brimstone Series

The Brimstone series consists of poorly drained, slowly permeable soils that formed in loamy sediments of late Pleistocene age. These soils have a high concentration of sodium in the lower part of the subsoil. They are on nearly level to slightly depressional, broad flats on stream or marine terraces. Slopes are less than 1 percent.

Soils of the Brimstone series are fine-silty, siliceous, thermic Glossic Natraqualfs.

The Brimstone soils in Livingston Parish are taxadjuncts because reaction in the E and B horizons is lower than is definitive for the Brimstone series. The Brimstone series is medium acid to moderately alkaline in these horizons. This difference, however, does not affect the use and management of the soils.

Brimstone soils commonly are near Deerford, Gilbert, Olivier, Satsuma, and Verdun soils. Deerford and Verdun soils are somewhat poorly drained and are slightly higher on the landscape than the Brimstone soils. Also, they are browner throughout. Gilbert, Olivier, and Satsuma soils do not have a natric horizon. Gilbert soils are in landscape positions similar to those of the Brimstone soils. Olivier and Satsuma soils are on low ridges and are somewhat poorly drained.

Typical pedon of Brimstone silt loam, in an area of Gilbert-Brimstone silt loams, occasionally flooded; 1.8 miles southeast of Walker, 0.60 miles north of Interstate 12, and 200 feet west of paved road; sec. 34, T. 6 S., R. 3 E.

A—0 to 4 inches; grayish brown (10YR 5/2) silt loam; weak fine granular structure; friable; many fine and common medium roots; very strongly acid; clear smooth boundary.

Eg—4 to 18 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; friable; common fine, medium, and coarse roots; very strongly acid; clear wavy boundary.

E/Bg—18 to 24 inches; about 70 percent vertical seams of light brownish gray (10YR 6/2) silt loam (E); light brownish gray (10YR 6/2) silt loam (Bt); common medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; common fine, medium, and coarse roots; very strongly acid; gradual irregular boundary.

B/Eg—24 to 30 inches; light brownish gray (2.5Y 6/2) silty clay loam (Bt); light brownish gray (10YR 6/2) silt loam (E); common medium distinct yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable (E) and firm (Bt); common fine and medium roots; many fine pores; few distinct clay films on faces of peds; strongly acid; clear wavy boundary.

Btng1—30 to 48 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium prominent strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; few fine and medium roots; common distinct clay films on faces on peds; light gray (10YR 7/2) silt coatings on vertical faces of some peds; strongly acid; clear wavy boundary.

Btng2—48 to 60 inches; light brownish gray (2.5Y 6/2) silty clay loam; many medium prominent strong brown (7.5YR 5/6) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; many fine pores; common distinct clay films on faces of peds; many fine black concretions; medium acid.

The thickness of the solum ranges from about 40 to 100 inches. The content of exchangeable sodium ranges from 15 to 30 percent within the upper 6 inches of the natric horizon or within 16 inches of the surface. In the upper 30 inches, at least 50 percent of the effective cation-exchange capacity is occupied by exchangeable aluminum.

The A horizon has value of 3 to 5 and chroma of 1 or 2. It ranges from very strongly acid to mildly alkaline. The Eg horizon and the E part of the E/Bg and B/Eg horizons have value of 5 or 6 and chroma of 1 or 2. They are silt loam or very fine sandy loam. They range from very strongly acid to moderately alkaline. Tongues of the E horizon can extend into the Btng horizon. Some pedons have accumulations of dark gray clay, which typically occur as discontinuous bands. The Btng horizon has hue of 10YR, 2.5Y, or 5Y, value of 5 or 6, and chroma of 1 or 2. It has few to many mottles in shades of brown or gray. It is silt loam or silty clay loam. It ranges from strongly acid to moderately alkaline. The number of calcium carbonate concretions in this horizon ranges from none to common.

Bude Series

The Bude series consists of somewhat poorly drained, slowly permeable soils that have a fragipan. These soils formed in a silty mantle less than 4 feet thick and in the underlying loamy sediments of Pleistocene age. They are on uplands. Slopes range from 1 to 3 percent.

Soils of the Bude series are fine-silty, mixed, thermic Glossaquic Fragiudalfs.

The Bude soils in Livingston Parish are taxadjuncts because the Btx and 2Btx horizons have higher chroma than is definitive for the Bude series. Also, the Btx horizon is slightly thicker. The Bude series has chroma of 1 or 2. These differences, however, do not affect the use and management of the soils.

Bude soils are similar to Olivier soils and commonly are near Calhoun and Toula soils. Calhoun soils are in depressions and are poorly drained. They are grayish throughout. Olivier soils are on stream terraces. They contain less total sand than the Bude soils. Toula soils are higher on the landscape than the Bude soils and are moderately well drained. They do not have grayish mottles in the upper part of the subsoil.

Typical pedon of Bude silt loam, 1 to 3 percent slopes; 7.5 miles north of Satsuma, 1.3 miles north of Louisiana Highway 63, and 200 feet east of Louisiana Highway 449; sec. 10, T. 4 S., R. 4 E.

A—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable; many fine, medium, and coarse roots; very strongly acid; clear smooth boundary.

E—4 to 7 inches; light yellowish brown (10YR 6/4) silt loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak fine subangular blocky structure; friable; many fine, medium, and coarse roots; very strongly acid; clear wavy boundary.

EB—7 to 15 inches; yellowish brown (10YR 5/6) silt loam; common medium distinct strong brown (7.5YR 5/6) and light brownish gray (10YR 6/2) mottles; moderate fine and medium subangular blocky structure; friable; common fine, medium, and coarse roots; few brittle bodies; very strongly acid; clear wavy boundary.

BE—15 to 18 inches; yellowish brown (10YR 5/6) silt loam; common medium distinct light brownish gray (10YR 6/2) mottles; moderate coarse prismatic structure parting to moderate medium subangular blocky; firm; common fine and medium roots; few faint clay films on faces of peds; very strongly acid; clear wavy boundary.

E/Bx—18 to 25 inches; light brownish gray (10YR 6/2) (E) and yellowish brown (10YR 5/6) (Bt) silt loam; common medium prominent reddish brown (5YR 4/4) mottles; moderate very coarse prismatic structure; firm; common fine and medium roots in the E part; common bodies of very firm and brittle material in the Bt part; few faint clay films on faces of peds; strongly acid; clear wavy boundary.

Btx—25 to 36 inches; yellowish brown (10YR 5/6) silt loam; common medium distinct strong brown (7.5YR 5/6) mottles; moderate very coarse prismatic structure; very firm and brittle; few fine roots in seams; few faint clay films on faces of peds; few light brownish gray (10YR 6/2) seams of silt loam ⅛ inch wide surround prisms and make up 15 percent of the volume; strongly acid; gradual wavy boundary.

2Btx1—36 to 45 inches; brownish yellow (10YR 6/6) silt loam; common medium distinct strong brown (7.5YR 5/6) mottles; moderate very coarse prismatic structure; very firm and brittle; few fine roots in seams; few faint clay films on faces of peds; few light brownish gray (10YR 6/2) seams of silt loam ⅛ inch wide surround prisms and make up 15 percent of the volume; strongly acid; gradual wavy boundary.

2Btx2—45 to 60 inches; light yellowish brown (10YR 6/4) silt loam; weak very coarse prismatic structure; very firm and brittle; few fine roots in seams; few light brownish gray (10YR 6/2) seams of silt loam ⅛ inch wide surround prisms and make up 15 percent of the volume; strongly acid.

The solum is more than 60 inches thick. Depth to the fragipan ranges from 18 to 40 inches. Reaction generally ranges from very strongly acid to medium acid throughout the solum, but the A horizon is less acid in areas that have been limed. Typically, grayish mottles are within 16 inches of the surface. In the upper 30 inches, at least 50 percent of the effective cation-exchange capacity is occupied by exchangeable aluminum.

The A horizon has value of 4 and chroma of 2 or 3 or value of 3 and chroma of 1. The E horizon has value of 5 or 6 and chroma of 3 or value of 6 and chroma of 4. The EB and BE horizons have hue of 10YR, value of 4 to 6, and chroma of 4 to 8, or they have hue of 7.5YR, value of 5, and chroma of 6. They are silt loam or silty clay loam.

The E/Btx horizon is mottled in shades of brown or gray. The content of clay in this horizon is less than that in the EB, BE, and Btx horizons.

The Btx horizon has hue of 10YR or 2.5Y, value of 6, and chroma of 2 or hue of 10YR, value of 5 or 6, and chroma of 1, or the color is a mixture of browns, yellows, and grays. This horizon is silt loam or silty clay loam. The 2Btx horizon has the same colors as the Btx horizon. It is silt loam, silty clay loam, or clay loam.

Cahaba Series

The Cahaba series consists of well drained, moderately permeable soils that formed in loamy and sandy sediments of late Pleistocene age. These soils are on low stream terraces along the major drainageways, or they occur as low ridges or mounds on broad marine or stream terraces. Slopes range from 1 to 3 percent.

Soils of the Cahaba series are fine-loamy, siliceous, thermic Typic Hapludults.

Cahaba soils commonly are near Calhoun, Dexter, Gilbert, Myatt, and Satsuma soils. Calhoun, Gilbert, and Myatt soils are in the lower landscape positions and are poorly drained. They are grayish throughout. Dexter and Satsuma soils are fine-silty. Dexter soils are in landscape positions similar to those of the Cahaba soils. Satsuma soils are slightly lower on the landscape than the Cahaba soils and are somewhat poorly drained.

Typical pedon of Cahaba fine sandy loam, 1 to 3 percent slopes; 2.5 miles southeast of Georgeville, 1 mile south of Lighthouse Church, 1.5 miles east of Louisiana Highway 43, and 200 feet west of parish road; sec. 10, T. 5 S., R. 6 E.

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

Bt1—5 to 14 inches; red (2.5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; friable; few fine roots; few faint clay films on faces of peds; very strongly acid; clear wavy boundary.

Bt2—14 to 35 inches; yellowish red (5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; friable; few fine roots; few faint clay films on faces of peds; few coarse distinct light yellowish brown (10YR 6/4) uncoated sand grains; very strongly acid; gradual wavy boundary.

BC—35 to 53 inches; strong brown (7.5YR 4/6) sandy loam; weak fine subangular blocky structure; friable; few faint clay films on vertical faces of some peds; many coarse distinct pale brown (10YR 6/3) uncoated sand grains; very strongly acid; gradual wavy boundary.

C—53 to 60 inches; strong brown (7.5YR 5/6) loamy sand; massive; very friable; many coarse distinct light yellowish brown (10YR 6/4) uncoated sand grains; very strongly acid.

The thickness of the solum ranges from 36 to 60 inches. Reaction ranges from very strongly acid to medium acid throughout the profile. In the upper 30 inches, at least 50 percent of the effective cation-exchange capacity is occupied by exchangeable aluminum.

The A horizon has value of 3 to 5 and chroma of 2 to 4. It is 4 to 8 inches thick. Some pedons have an E or E/B horizon. These horizons have hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 to 4.

The Bt horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 to 8. It is sandy clay loam, loam, or clay loam. The content of clay in this horizon ranges from 18 to 35 percent. The BC horizon is typically strong brown, yellowish red, or red. It is less clayey than the Bt horizon. It is sandy loam or fine sandy loam.

The C horizon ranges from yellowish brown to red. It is commonly stratified with sand, loamy sand, or fine sandy loam. It has few to many pebbles in some pedons.

Calhoun Series

The Calhoun series consists of poorly drained, slowly permeable soils that formed in loess. These soils are at low elevations on uplands of Pleistocene age. They are subject to rare or occasional flooding. Slopes are less than 1 percent.

Soils of the Calhoun series are fine-silty, mixed, thermic Typic Glossaqualfs.

Calhoun soils commonly are near Bude, Gilbert, Olivier, and Toula soils. Bude, Olivier, and Toula soils are higher on the landscape than the Calhoun soils. They have a fragipan. Gilbert soils are along small drainageways. They contain more sand throughout than the Bude soils.

Typical pedon of Calhoun silt loam; 2.5 miles northwest of Magnolia, 1.75 miles north of Louisiana Highway 442, and 100 feet east of dirt road; sec. 29, T. 5 S., R. 5 E.

A—0 to 3 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable; common fine, medium, and coarse roots; very strongly acid; abrupt smooth boundary.

Eg1—3 to 12 inches; light brownish gray (10YR 6/2) silt loam; common medium prominent strong brown (7.5YR 5/6) mottles; weak fine granular structure; friable; common fine, medium, and coarse roots; very strongly acid; gradual wavy boundary.

Eg2—12 to 18 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct yellowish brown (10YR 5/6) and common medium prominent strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; friable; few fine and common medium and coarse roots; very strongly acid; gradual irregular boundary.

E/Bg—18 to 30 inches; about 70 percent light brownish gray (10YR 6/2) silt loam (E) and 30 percent light brownish gray (10YR 6/2) silty clay loam (Bt); common medium distinct yellowish brown (10YR 5/6) and common medium prominent strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; friable; few medium and coarse roots; the Bt material occurs as discontinuous prisms within the E material; very strongly acid; gradual irregular boundary.

B/Eg—30 to 36 inches; about 70 percent light brownish gray (10YR 6/2) silty clay loam (Bt) and 30 percent light brownish gray (10YR 6/2) silt loam (E); common medium distinct yellowish brown (10YR 5/6) and common medium prominent strong brown (7.5YR 5/6) mottles; moderate very coarse prismatic structure parting to moderate medium subangular blocky; friable; few fine, medium, and coarse roots; few faint clay films on faces of some peds; the E material occurs as tongues 2 to 5 inches wide between prisms of the Bt material; very strongly acid; gradual irregular boundary.

Btg—36 to 48 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; few fine and medium roots; few faint clay films on faces of peds; very strongly acid; clear wavy boundary.

BCg—48 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; firm; few fine roots; many fine black and brown concretions; medium acid.

The thickness of the solum ranges from 40 to 80 inches. In the upper 30 inches, at least 50 percent of the effective cation-exchange capacity is occupied by exchangeable aluminum.

The A horizon has value of 4 to 6 and chroma of 1 to 3. It is 0 to 8 inches thick. It ranges from extremely acid to medium acid.

The Eg horizon and the E part of the B/Eg horizon have hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. They have few to many mottles. They are very strongly acid to medium acid. They range from 9 to 20 inches in thickness.

The Btg horizon and the Bt part of the B/Eg horizon have hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. They have few to many mottles. They are silt loam or silty clay loam. They are very strongly acid or strongly acid.

The BCg and Cg horizons have hue of 10YR, 2.5Y, or 5Y, value of 5 or 6, and chroma of 1 to 3. They have few to many mottles. They are silt loam or silty clay loam. They range from very strongly acid to mildly alkaline.

Colyell Series

The Colyell series consists of somewhat poorly drained, slowly permeable soils that formed in a silty mantle 1 to 3 feet thick and in the underlying clayey and loamy material of late Pleistocene age. These soils are on stream or marine terraces. Slopes range from 0 to 3 percent.

Soils of the Colyell series are fine, montmorillonitic, thermic Glossaquic Hapludalfs.

Colyell soils commonly are near Barbary, Deerford, Encrow, Natalbany, Springfield, and Verdun soils. Barbary soils are in swamps and are very poorly drained. They are very fluid throughout. Deerford and Verdun soils are slightly higher on the landscape than the Colyell soils. They have a natric horizon. Encrow soils are in depressions and are poorly drained. They are grayish throughout. Natalbany soils are on flood plains and are poorly drained. They have a subsoil that shrinks upon drying and cracks to a depth of 20 inches or more. Springfield soils are lower on the landscape than the Colyell soils and are poorly drained. They are characterized by an abrupt textural change between the albic horizon and the argillic horizon.

Typical pedon of Colyell silt loam, 1 to 3 percent slopes; 1.25 miles southeast of Verdun, 3,000 feet east of Bayou La Glaise, and 200 feet west of dirt road; sec. 29, T. 8 S., R. 5 E.

A—0 to 3 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable; many fine and common medium and coarse roots; very strongly acid; clear smooth boundary.

E—3 to 8 inches; yellowish brown (10YR 5/4) silt; few medium distinct strong brown (7.5YR 5/6) mottles; weak fine subangular blocky structure; friable; common fine, medium, and coarse roots; few fine pores; many medium black and brown concretions; very strongly acid; clear smooth boundary.

EB—8 to 12 inches; yellowish brown (10YR 5/4) silt loam; few medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; common fine, medium, and coarse roots; very strongly acid; clear wavy boundary.

2B/E—12 to 15 inches; mottled light brownish gray (10YR 6/2), yellowish brown (10YR 5/4), and yellowish red (5YR 4/6) silty clay (Bt); weak medium subangular blocky structure; firm; common fine and medium roots; few fine pores; common distinct clay films on faces of peds; many black and brown concretions; about 15 percent, by volume, interfingers of light brownish gray (10YR 6/2) silt loam (E) between peds; very strongly acid; clear wavy boundary.

2Bt1—15 to 23 inches; mottled yellowish brown (10YR 5/4) and light brownish gray (10YR 6/2) silty clay; many medium prominent yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; firm; few fine and medium roots; common distinct clay films on faces of peds; few faint light gray (10YR 7/2) coatings of silt on faces of some peds; very strongly acid; clear wavy boundary.

2Bt2—23 to 39 inches; yellowish brown (10YR 5/6) silty clay loam; common medium distinct light brownish gray (10YR 6/2) and few fine distinct strong brown (7.5YR 4/6) mottles; moderate medium subangular blocky structure; firm; few fine roots; few distinct clay films on faces of peds; strongly acid; clear wavy boundary.

3Btn1—39 to 48 inches; light olive brown (2.5Y 5/6) silty clay loam; common medium distinct light brownish gray (2.5Y 6/2) mottles; moderate coarse prismatic structure; firm; common shiny pressure faces on some peds; few faint clay films on faces of peds; few black stains; strongly acid; clear wavy boundary.

3Btn2—48 to 60 inches; light olive brown (2.5Y 5/6) silty clay loam; common medium distinct light brownish gray (2.5Y 6/2) mottles; weak coarse prismatic structure; firm; few faint clay films on faces of peds; medium acid.

The thickness of the solum ranges from 30 to 70 inches. The thickness of the loess mantle ranges from 1 to 3 feet. The depth to horizons with 5 to 15 percent exchangeable sodium ranges from 30 to 50 inches. In the upper 30 inches, 10 to 50 percent of the effective cation-exchange capacity is occupied by exchangeable aluminum.

The A horizon has value of 3 to 5 and chroma of 1 to 3. It generally ranges from very strongly acid to medium acid, but it is less acid in areas that have been limed.

The E and EB horizons have value of 5 or 6 and chroma of 4 to 8. They have few to many mottles in shades of brown or gray. They are silt loam or silt. They range from very strongly acid to medium acid. The E part of the 2B/E horizon has value of 5 to 7 and chroma of 2 or 3. It ranges from very strongly acid to medium acid.

The 2Bt horizon and the Bt part of the 2B/E horizon have value of 5 or 6 and chroma of 3 to 8, or they are mottled in shades of brown, gray, or red. They are silty clay loam, silty clay, or clay. They range from very strongly acid to neutral.

The 3Btn horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 to 8. It has few to many mottles in shades of brown and gray. It ranges from strongly acid to moderately alkaline. It is silty clay loam or silt loam. The content of exchangeable sodium in this horizon ranges from 5 to 15 percent.

Deerford Series

The Deerford series consists of somewhat poorly drained, slowly permeable soils that formed in silty material of late Pleistocene age. These soils have high levels of sodium in the middle and lower parts of the subsoil. They are on broad stream or marine terraces that have low relief. Slopes are less than 1 percent.

Soils of the Deerford series are fine-silty, mixed, thermic Albic Glossic Natraqualfs.

Deerford soils commonly are near Colyell, Olivier, Springfield, and Verdun soils. Colyell soils are on ridges and side slopes along drainageways. They do not have a natric horizon. Olivier soils are higher on the landscape than the Deerford soils. They have a fragipan. Springfield soils are in the lower landscape positions and are poorly drained. They do not have a natric horizon. Verdun soils are in landscape positions similar to those of the Deerford soils. They have more than 15 percent exchangeable sodium throughout the subsoil.

Typical pedon of Deerford silt loam, in an area of Deerford-Verdun silt loams; 7 miles south of Walker, 1.8 miles east of Louisiana Highway 447, and 200 feet north of parish road; sec. 32, T. 7 S., R. 4 E.

A—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable; many fine roots; very strongly acid; abrupt smooth boundary.

E—4 to 10 inches; brown (10YR 5/3) silt loam; weak fine subangular blocky structure; friable; many fine roots; strongly acid; abrupt smooth boundary.

B/E1—10 to 19 inches; grayish brown (10YR 5/2) silty clay loam (Bt); common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; common fine roots; few vertical tongues of brown (10YR 5/3) silt loam E material 2 to 4 inches wide; few faint clay films on faces of peds; few fine black and brown concretions; very strongly acid; gradual wavy boundary.

B/E2—19 to 27 inches; yellowish brown (10YR 5/6) silty clay loam (Bt); common medium distinct grayish brown (10YR 5/2) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few fine and medium roots; common faint clay films on faces of peds; few vertical tongues of silt loam (E) 1 to 4 inches wide; very strongly acid; gradual wavy boundary.

Bn/E—27 to 34 inches; yellowish brown (10YR 5/4) silty clay loam (Bt); common medium distinct light brownish gray (10YR 6/2) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; few faint clay films on faces of peds; common fine and medium black and brown concretions; few vertical tongues of pale brown (10YR 6/3) E material; medium acid; gradual wavy boundary.

Btn—34 to 40 inches; light olive brown (2.5Y 5/6) silty clay loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; few faint clay films on faces of peds; common fine and medium black and brown concretions; mildly alkaline; gradual wavy boundary.

BCn—40 to 60 inches; light olive brown (2.5Y 5/4) silt loam; few fine prominent strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; few black and brown concretions; moderately alkaline.

The thickness of the solum ranges from 40 to 80 inches. The depth to a subhorizon with more than 15 percent exchangeable sodium ranges from 16 to 32 inches. In the upper 30 inches, 20 to 50 percent of the effective cation-exchange capacity is occupied by aluminum.

The A horizon has value of 4 to 6 and chroma of 2 or 3. It ranges from very strongly acid or medium acid. It is 3 to 14 inches thick.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 2 or 3. It is silt or silt loam. It ranges from very strongly acid to slightly acid.

The interiors of peds in the B/E horizon, the Bn part of the Bn/E horizon, and the Btn horizon have hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 3 to 6. These horizons are silty clay loam or silt loam. They range from very strongly acid to slightly acid in the upper part and from neutral to moderately alkaline in the lower part.

The BCn horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 6. It has few to many mottles in shades of brown or gray. It is silt loam or silty clay loam. It ranges from neutral to moderately alkaline.

Dexter Series

The Dexter series consists of well drained, moderately permeable soils that formed in loamy sediments of mixed mineralogy. These soils are mainly on stream terraces of Pleistocene age. Slopes range from 1 to 3 percent.

Soils of the Dexter series are fine-silty, mixed, thermic Ultic Hapludalfs.

Dexter soils commonly are near Cahaba, Gilbert, Olivier, and Satsuma soils. Cahaba soils are in landscape positions similar to those of the Dexter soils. They are fine-loamy. Gilbert soils are in depressions and are poorly drained. They are grayish throughout. Olivier and Satsuma soils are lower on the landscape than the Dexter soils and are somewhat poorly drained. Olivier soils have a fragipan, and Satsuma soils have siliceous mineralogy.

Typical pedon of Dexter very fine sandy loam, 1 to 3 percent slopes; 2.9 miles northwest of Port Vincent and 700 feet west of Louisiana Highway 16; Spanish Land Grant sec. 43, T. 8 S., R. 3 E.

Ap—0 to 6 inches; dark brown (7.5YR 4/4) very fine sandy loam; weak fine granular structure; friable; many fine roots; very strongly acid; clear smooth boundary.

Bt1—6 to 18 inches; reddish brown (5YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable; few fine roots; few faint clay films on faces of peds; very strongly acid; clear wavy boundary.

Bt2—18 to 34 inches; yellowish red (5YR 4/6) silty clay loam; moderate medium subangular blocky structure; friable; few fine roots; few distinct clay films on faces of peds; strongly acid; clear wavy boundary.

2BC—34 to 46 inches; yellowish red (5YR 4/6) clay loam; weak medium subangular blocky structure; friable; strongly acid; gradual wavy boundary.

2C—46 to 60 inches; yellowish red (5YR 4/6) fine sandy loam; massive; friable; pockets of light brown (7.5YR 6/4) sand and streaks of light brown (7.5YR 6/4) sand inside peds; very strongly acid.

The thickness of the solum ranges from 32 to 60 inches. In the upper 30 inches, 20 to 50 percent of the effective cation-exchange capacity is occupied by aluminum.

The Ap horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. It is 4 to 10 inches thick. It ranges from very strongly acid to slightly acid.

The Bt horizon has matrix colors or ped surfaces with value of 4 or 5 and chroma of 4 to 6. It is silt loam, silty clay loam, or clay loam. It ranges from very strongly acid to medium acid. The 2BC horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It is sandy loam, loam, clay loam, or sandy clay loam. It ranges from very strongly acid to medium acid.

The 2C horizon has colors similar to those of the 2BC horizon. It is typically fine sandy loam or loamy fine sand, but the range includes sandy clay loam and clay loam. This horizon ranges from very strongly acid to medium acid.

Encrow Series

The Encrow series consists of poorly drained, slowly permeable soils that formed in loess and local alluvium over clayey material of late Pleistocene age. These soils are at low elevations on stream or marine terraces. They are occasionally flooded. Slopes are 0 to 1 percent.

Soils of the Encrow series are fine, montmorillonitic, thermic Typic Glossaqualfs.

Encrow soils are similar to Springfield soils and commonly are near Barbary, Colyell, Deerford, Natalbany, Springfield, and Verdun soils. Barbary soils are in ponded swamps and are very fluid and clayey throughout. Colyell soils are on ridges and side slopes along drainageways and are somewhat poorly drained. They are brownish throughout. Deerford and Verdun soils are higher on the landscape than the Encrow soils and are somewhat poorly drained. They have a natric horizon. Natalbany soils are on flood plains and are clayey throughout the subsoil. Springfield soils are in the slightly higher landscape positions. They are characterized by an abrupt textural change between the albic and argillic horizons.

Typical pedon of Encrow silt loam, occasionally flooded; about 4.5 miles southeast of Walker, 1.6 miles west of Petes Rest Cemetery, and 200 feet north of a gravel road; sec. 16, T. 7 S., R. 4 E.

A—0 to 4 inches; grayish brown (10YR 5/2) silt loam; weak fine granular structure; friable; many fine and common coarse and medium roots; very strongly acid; abrupt smooth boundary.

Eg—4 to 12 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct yellowish brown (10YR 5/4 and 5/6) mottles; weak fine subangular blocky structure; friable; many fine and common coarse and medium roots; very strongly acid; gradual irregular boundary.

E/Bg—12 to 27 inches; about 70 percent tongues of light brownish gray (10YR 6/2) silt loam (E) and 30 percent gray (10YR 5/1) silty clay loam (Bt); common medium distinct brown (7.5YR 4/4) and few fine prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; firm; common fine and medium roots; many fine pores;

common distinct very dark gray clay films on faces of some peds; very strongly acid; abrupt irregular boundary.

2Btg1—27 to 36 inches; dark gray (10YR 4/1) silty clay; common medium prominent red (2.5YR 4/6) and strong brown (7.5YR 5/6) mottles; moderate coarse prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; many distinct very dark gray (10YR 3/1) clay films on vertical faces of peds; tongues of light brownish gray (10YR 6/2) silt loam 1 to 4 inches wide make up about 5 percent of the horizon; extremely acid; gradual wavy boundary.

2Btg2—36 to 42 inches; gray (10YR 5/1) silty clay; common medium distinct yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure parting to moderate medium angular blocky; firm; few fine roots; common fine pores; few distinct very dark gray (10YR 3/1) clay films on vertical faces of peds; extremely acid; gradual wavy boundary.

2Btg3—42 to 48 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium prominent yellowish brown (10YR 5/8) mottles; weak coarse prismatic structure parting to moderate medium angular blocky; firm; few fine pores; few faint clay films on faces of peds; extremely acid; gradual wavy boundary.

2BCng—48 to 60 inches; light olive gray (5Y 6/2) silty clay loam; common coarse prominent yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles; weak coarse prismatic structure parting to moderate medium angular blocky; firm; many fine black concretions; extremely acid.

The solum ranges from 60 to 80 inches in thickness. It generally ranges from extremely acid to slightly acid, but the A horizon is less acid in areas that have been limed. In the upper 30 inches, at least 50 percent of the effective cation-exchange capacity is occupied by aluminum.

The A horizon has value of 3 to 5 and chroma of 1 to 3. The Eg horizon and the E part of the E/Bg horizon have value of 5 to 7 and chroma of 1 or 2. They have few to many mottles in shades of brown or red. They are silt loam or very fine sandy loam.

The 2Btg horizon and the Bt part of the E/Bg horizon have hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. They have very dark gray or dark gray faces of peds. They have few to many mottles in shades of red or brown. Typically, the Bt part of the E/Bg horizon is silty clay loam, but it is silt loam in some pedons. The 2Btg horizon is silty clay loam, silty clay, or clay.

The 2BCng horizon has hue of 10YR, 2.5Y, or 5Y, value of 5 or 6, and chroma of 1 or 2. It has few to many mottles in shades of brown or gray. It is silty clay loam or silt loam. The content of exchangeable sodium in this horizon ranges from 5 to 15 percent.

Gilbert Series

The Gilbert series consists of poorly drained, very slowly permeable soils that formed in loess and loamy material of late Pleistocene age. These soils have high levels of sodium in the lower part of the subsoil. They are on stream or marine terraces. Slopes are less than 1 percent.

Soils of the Gilbert series are fine-silty, mixed, thermic Typic Glossaqualfs.

Gilbert soils are similar to Guyton soils and commonly are near Brimstone, Cahaba, Deerford, Dexter, Myatt, Satsuma, and Verdun soils. Brimstone, Guyton, and Myatt soils are in landscape positions similar to those of the Gilbert soils. Brimstone soils have a natric horizon. Guyton soils do not have a high concentration of sodium in the lower part of the subsoil. Myatt soils are fine-loamy. Cahaba and Dexter soils are higher on the landscape than the Gilbert soils and are well drained. They have a reddish subsoil. Deerford, Satsuma, and Verdun soils are slightly higher on the landscape than the Gilbert soils and are somewhat poorly drained. Deerford and Verdun soils have a natric horizon. Satsuma soils do not have a high concentration of sodium in the lower part of the subsoil.

Typical pedon of Gilbert silt loam; 3.1 miles northwest of Springfield, 0.5 mile west of Breed Branch, 950 feet east of Blood River, and 100 feet north of Louisiana Highway 42; sec. 16, T. 7 S., R. 6 E.

A—0 to 4 inches; grayish brown (10YR 5/2) silt loam; weak fine granular structure; friable; many coarse and fine roots; strongly acid; clear smooth boundary.

Eg1—4 to 7 inches; light brownish gray (10YR 6/2) silt loam; weak fine granular structure; friable; few fine roots; few fine black stains on faces of peds; strongly acid; clear smooth boundary.

Eg2—7 to 12 inches; light brownish gray (10YR 6/2) silt loam; weak fine granular structure; friable; few fine roots; many fine black and brownish yellow (10YR 6/8) stains on faces of peds; strongly acid; clear irregular boundary.

B/Eg—12 to 28 inches; about 65 percent grayish brown (2.5Y 5/2) silty clay loam (Bt) and about 35 percent light brownish gray (10YR 6/2) silt loam (E); many medium prominent yellowish brown (10YR 5/8) and many medium distinct light olive brown (2.5Y 5/6) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm (Bt) and friable (E); common faint clay films on faces of peds; very strongly acid; gradual irregular boundary.

Btng1—28 to 43 inches; light brownish gray (2.5Y 6/2) silty clay loam; weak coarse prismatic structure parting to weak medium subangular blocky; firm; common faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btng2—43 to 60 inches; light brownish gray (2.5Y 6/2) silty clay loam; weak coarse prismatic structure parting to weak medium subangular blocky; firm; many fine pores; common faint clay films on faces of peds; many black stains on faces of peds; few fine concretions of calcium carbonate; few medium brown and many fine black concretions; mildly alkaline.

The thickness of the solum ranges from 60 to 100 inches. The content of exchangeable sodium ranges from 15 to 35 percent within 17 to 40 inches of the upper boundary of the argillic horizon. In the upper 30 inches, 20 to 50 percent of the effective cation-exchange capacity is occupied by aluminum.

The A horizon has value of 4 to 6 and chroma of 2 or 3. It generally ranges from very strongly acid or medium acid, but it is less acid in areas that have been limed.

The Eg horizon and the E part of the B/Eg horizon have hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. The number of mottles in shades of brown or gray ranges from none to common. Reaction ranges from very strongly acid to medium acid.

The Btng horizon and the Bt part of the B/Eg horizon have hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. They are silt loam or silty clay loam in the upper part and silt loam, silty clay loam, loam, or clay loam in the lower part. They have few to many mottles in shades of brown or gray. Reaction ranges from very strongly acid to medium acid in the Btng1 and B/Eg horizons and from neutral to strongly alkaline in the Btng2 horizon.

Guyton Series

The Guyton series consists of poorly drained, slowly permeable soils that formed in loamy sediments. These soils are in broad depressional areas on stream or marine terraces and on flood plains. Slopes are less than 1 percent.

Soils of the Guyton series are fine-silty, siliceous, thermic Typic Glossaqualfs.

Guyton soils commonly are near Abita, Myatt, Ochlockonee, Ouachita, and Stough soils. Abita and Stough soils are on ridges and are somewhat poorly drained. They have a brownish subsoil. Myatt soils are in landscape positions similar to those of the Guyton soils. They are fine-loamy. Ochlockonee and Ouachita soils are on flood plains and are well drained. They are brownish throughout. Also, Ochlockonee soils are coarse-loamy.

Typical pedon of Guyton silt loam, in an area of Ouachita, Ochlockonee, and Guyton soils, frequently flooded; 100 feet east of Parish Highway 1032 and 1,800 feet north of Amite Church; Spanish Land Grant sec. 64, T. 6 S., R. 2 E.

A—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable; many fine roots; strongly acid; clear smooth boundary.

Eg1—6 to 12 inches; grayish brown (10YR 5/2) silt loam; common medium distinct yellowish brown (10YR 5/6) and common medium prominent strong brown (7.5YR 5/6) mottles; weak fine granular structure; friable; many fine roots; strongly acid; clear wavy boundary.

Eg2—12 to 24 inches; light brownish gray (10YR 6/2) silt loam; many medium yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; friable; common fine roots; strongly acid; gradual irregular boundary.

E/Bg—24 to 34 inches; gray (10YR 5/1) silt loam (E) and silty clay loam (Bt); many fine prominent yellowish brown (10YR 5/6) and common medium prominent light brown (7.5YR 6/4) mottles; weak fine subangular blocky structure; friable; common fine roots; many medium light gray (10YR 7/1) silt coatings on faces of peds; few faint clay films on vertical faces of peds; about 20 percent grayish brown (10YR 5/2) silty clay loam (Bt); strongly acid; gradual irregular boundary.

B/Eg—34 to 44 inches; grayish brown (10YR 5/2) silty clay loam and silt loam (Bt); many fine distinct dark brown (7.5YR 4/4) mottles; moderate medium subangular blocky structure; friable; few fine roots; common distinct clay films on vertical faces of peds; about 20 percent tongues of gray (10YR 5/1) silt loam (E) about ½ inch wide and 7 inches long; many fine black and brown concretions; strongly acid; gradual irregular boundary.

Btg—44 to 60 inches; gray (10YR 6/1) silty clay loam;

common medium distinct yellowish brown (10YR 5/4 and 5/6) and common medium prominent strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; common faint clay films on faces of peds; many fine black and brown concretions; strongly acid.

The thickness of the solum ranges from 50 to about 80 inches. The content of sandy material, dominantly very fine sand, ranges from 10 to 40 percent in the family textural control section. In the upper 30 inches, at least 50 percent of the effective cation-exchange capacity is occupied by aluminum.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 or 3. It generally ranges from extremely acid to medium acid, but it is less acid in areas that have been limed.

The Eg horizon and the E part of the E/Bg and B/Eg horizons have hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 1 or 2. They are silt loam, loam, or very fine sandy loam. They range from extremely acid to medium acid. Tongues of E material extend into the Bt horizon.

The Btg horizon and the Bt part of the E/Bg and B/Eg horizons have hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. They are silt loam, silty clay loam, or clay loam. They range from extremely acid to medium acid.

Some pedons have a BCg or Cg horizon. These horizons have the same range in colors as the Btg horizon. They are silt loam, silty clay loam, clay loam, or sandy clay loam. The BCg horizon ranges from extremely acid to medium acid, and the Cg horizon ranges from strongly acid to moderately alkaline.

Maurepas Series

The Maurepas series consists of very poorly drained, rapidly permeable soils that formed in well decomposed organic material consisting mainly of woody fibers. These soils are in low, broad, ponded backwater swamps. Slopes are less than 1 percent.

Soils of the Maurepas series are euic, thermic Typic Medisaprists.

Maurepas soils commonly are near Barbary soils. Barbary soils are at the slightly higher elevations. They are clayey, very fluid, mineral soils.

Typical pedon of Maurepas muck; 3 miles southeast of Tickfaw Marina, 250 feet south of the Tickfaw River, 4,000 feet north of Lake Shore Canal, and 150 feet east of unnamed drainage canal; sec. 16, T. 8 S., R. 7 E.

Oa1—0 to 12 inches; very dark grayish brown (10YR 3/2) muck, same color pressed and rubbed; about 15 percent fiber, 5 percent rubbed; massive; very fluid (flows easily between fingers when squeezed, leaving hand empty); about 45 percent mineral material; slightly acid; gradual wavy boundary.

Oa2—12 to 27 inches; dark yellowish brown (10YR 3/4) muck, same color pressed and rubbed; about 10 percent fiber, 5 percent rubbed; massive; very fluid (flows easily between fingers when squeezed, leaving hand empty); dominantly woody fiber; about 30 percent mineral material; slightly acid; gradual wavy boundary.

Oa3—27 to 45 inches; very dark grayish brown (10YR 3/2) muck, same color pressed and rubbed; about 10 percent fiber, 5 percent rubbed; massive; very fluid (flows easily between fingers when squeezed, leaving hand empty); dominantly woody fiber; many fragments of wood ½ to 1 inch in diameter; about 30 percent mineral material; slightly acid; gradual wavy boundary.

Oa4—45 to 84 inches; dark yellowish brown (10YR 3/4) muck, same color pressed and rubbed; about 10 percent fiber, 5 percent rubbed; massive; very fluid (flows easily between fingers when squeezed, leaving hand empty); dominantly woody fiber; many fragments of wood ½ to 1 inch in diameter; many logs; about 30 percent mineral material; slightly acid.

The depth of the organic material over very fluid clay ranges from 51 to more than 80 inches. Reaction ranges from medium acid to moderately alkaline throughout the profile. More than half of the subsurface and bottom tiers are nonsaline or slightly saline. Few to many logs, stumps, or wood fragments are in at least one of the organic layers.

The surface tier has hue of 5YR, 7.5YR, or 10YR, value of 3 or less, and chroma of 2 or less. After rubbing, it has 2 to 4 percent fiber.

The subsurface and bottom tiers have hue of 5YR, 7.5YR, or 10YR, value of 2 or 3, and chroma of 4 or less. The subsurface tier has as much as 60 percent fiber before rubbing and less than 10 percent after rubbing. The bottom tier typically has less than 10 percent fiber after rubbing.

Fibers are dominantly woody, but some pedons have as much as 45 percent herbaceous fiber in the 0- to 51-inch control section. The organic layers contain 15 to 45 percent mineral material. They are typically underlain by very fluid, gray clay.

Myatt Series

The Myatt series consists of poorly drained, moderately slowly permeable soils that formed in loamy sediments of late Pleistocene age. These soils are on broad stream or marine terraces. Slopes are less than 1 percent.

Soils of the Myatt series are fine-loamy, siliceous, thermic Typic Ochraquults.

Myatt soils commonly are near Abita, Guyton, Satsuma, and Stough soils. Abita, Satsuma, and Stough soils are somewhat poorly drained and are higher on the landscape than the Myatt soils. Also, they have a browner subsoil. Guyton soils are in landscape positions similar to those of the Myatt soils. They are fine-silty.

Typical pedon of Myatt fine sandy loam; 7,000 feet southeast of Starn, 12,000 feet north of U.S. Highway 190, and 5,800 feet east of Louisiana Highway 441; sec. 7, T. 6 S., R. 6 E.

A—0 to 4 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; friable; many fine and common medium and coarse roots; few fine black and brown concretions; very strongly acid; clear smooth boundary.

Eg—4 to 10 inches; light brownish gray (10YR 6/2) fine sandy loam; few medium distinct yellowish brown (10YR 5/6) mottles; weak fine granular structure; friable; common fine roots; common fine, medium, and coarse black and brown concretions; very strongly acid; gradual wavy boundary.

Btg1—10 to 26 inches; grayish brown (10YR 5/2) loam; common medium distinct light olive brown (2.5Y 5/4) mottles; weak fine and moderate medium subangular blocky structure; friable; few fine roots; few distinct clay films on faces of peds; many medium and coarse black and brown concretions; very strongly acid; clear wavy boundary.

Btg2—26 to 38 inches; gray (10YR 5/1) sandy clay loam; many coarse prominent strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm; few fine roots; many faint clay films on faces of peds; light gray (10YR 7/2) uncoated sand grains on faces of some peds; few medium black and brown concretions; very strongly acid; clear wavy boundary.

Btg3—38 to 58 inches; light brownish gray (2.5Y 6/2) sandy clay loam; common medium prominent brownish yellow (10YR 6/6) and strong brown (7.5YR 5/8) mottles; weak coarse subangular blocky structure; firm; few fine roots; few faint clay films on faces of peds; few fine and medium black and brown concretions; very strongly acid; clear wavy boundary.

Cg—58 to 60 inches; light gray (10YR 6/1) sandy clay loam; few medium prominent yellowish brown (10YR 5/8) mottles; massive; firm; very strongly acid.

The thickness of the solum ranges from 40 to 60 inches. In the upper 30 inches, at least 50 percent of the effective cation-exchange capacity is occupied by aluminum.

The A horizon has value of 3 to 6 and chroma of 1 or 2. It ranges from very strongly acid to medium acid.

The Eg horizon has hue of 10YR or 2.5Y. It has value of 6 and chroma of 1 or 2 or value of 5 and chroma of 1. It is loamy fine sand, sandy loam, fine sandy loam, very fine sandy loam, or loam. It ranges from very strongly acid to medium acid.

The Btg horizon has hue of 10YR, 2.5Y, or 5Y, value of 5 to 7, and chroma of 1 or 2. It has few to many mottles in shades of brown, red, or yellow. It is sandy clay loam, loam, or clay loam. It ranges from extremely acid to strongly acid.

Some pedons have a BCg horizon. This horizon is mottled in hue of 10YR, 2.5Y, or 5Y, value of 6 or 7, and chroma of 1. It is sandy loam, sandy clay loam, or loam. It ranges from extremely acid to strongly acid.

The Cg horizon has hue of 10YR, 2.5Y, or 5Y, value of 6 or 7, and chroma of 1. It has few to many mottles in shades of brown. It is dominantly sandy loam, sandy clay loam, or clay loam, but thin strata of sand and gravel are in some pedons. This horizon ranges from extremely acid to strongly acid.

Natalbany Series

The Natalbany series consists of poorly drained, very slowly permeable soils that formed in clayey and loamy sediments of Holocene or late Pleistocene age. These soils are on flood plains along drainageways adjacent to swamps. Slopes are less than 1 percent.

Soils of the Natalbany series are fine, montmorillonitic, thermic Vertic Ochraqualfs.

Natalbany soils commonly are near Barbary, Colyell, and Springfield soils. Barbary soils are in swamps. They are very fluid, clayey soils. Colyell and Springfield soils are higher on the landscape than the Natalbany soils. Colyell soils are somewhat poorly drained. They are brownish throughout. Springfield soils are characterized by an abrupt textural change between the albic horizon and the argillic horizon.

Typical pedon of Natalbany silty clay loam, frequently flooded; 0.9 mile southeast of Frost, 3,900 feet south of

Louisiana Highway 42, and 200 feet east of Gum Swamp Road; sec. 32, R. 5 E., T. 7 S.

A—0 to 5 inches; dark grayish brown (10YR 4/2) silty clay loam; weak fine granular structure; friable; few fine and medium roots; very strongly acid; clear smooth boundary.

Btg1—5 to 17 inches; dark gray (10YR 4/1) silty clay; common medium prominent yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; few fine and medium roots; few faint very dark gray (10YR 3/1) clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg2—17 to 32 inches; dark gray (10YR 4/1) clay; many medium prominent strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; few fine and medium roots; many distinct very dark gray (10YR 3/1) clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg3—32 to 42 inches; grayish brown (2.5Y 5/2) clay; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; few medium roots; many distinct dark gray (10YR 4/1) clay films on faces of peds; extremely acid; gradual wavy boundary.

BCg—42 to 60 inches; grayish brown (2.5Y 5/2) silty clay; many medium prominent strong brown (7.5YR 5/6) mottles; weak coarse subangular blocky structure; firm; few medium roots; very strongly acid; clear wavy boundary.

Cg—60 to 80 inches; greenish gray (5BG 5/1) silty clay; common medium distinct light olive brown (2.5Y 5/4) mottles; massive; firm; common fine and medium black and brown concretions; neutral.

The thickness of the solum ranges from 40 to 80 inches. In the upper 30 inches, at least 50 percent of the effective cation-exchange capacity is occupied by exchangeable aluminum.

The A horizon has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 1 or 2. It generally ranges from extremely acid to medium acid, but it is less acid in areas that have been limed.

Some pedons have an Eg horizon. This horizon has value of 5 or 6 and chroma of 1 or 2. It is silt loam or silty clay loam. It ranges from extremely acid to medium acid.

The Btg horizon has hue of 10YR, 2.5Y, or 5Y, value of 3 to 6, and chroma of 1 or 2. It has few to many mottles in shades of brown or olive. It is silty clay or clay. It ranges from extremely acid to slightly acid.

The BCg and Cg horizons have hue of 10YR, 2.5Y, 5Y, or 5BG, value of 4 to 6, and chroma of 1, or they are neutral in hue and have value of 4 to 6. They are clay or silty clay. They range from very strongly acid to moderately alkaline.

Ochlockonee Series

The Ochlockonee series consists of well drained, moderately rapidly permeable soils that formed in sandy and loamy alluvium. These soils are on flood plains. Slopes range from 1 to 3 percent.

Soils of the Ochlockonee series are coarse-loamy, siliceous, acid, thermic Typic Udifluvents.

Ochlockonee soils commonly are near Cahaba, Guyton, and Ouachita soils. Cahaba soils are on stream terraces at the higher elevations. They are fine-loamy. Guyton soils are lower on the landscape than the Ochlockonee soils and are poorly drained. They are fine-silty and are grayish throughout. Ouachita soils are in landscape positions similar to those of the Ochlockonee soils. They are fine-silty.

Typical pedon of Ochlockonee sandy loam, in an area of Ouachita, Ochlockonee, and Guyton soils, frequently flooded; 1.5 miles north of Plainview, 300 feet east of the Amite River, and 800 feet west of Louisiana Highway 1032; Spanish Land Grant sec. 64, T. 6 S., R. 2 E.

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

C1—5 to 18 inches; yellowish brown (10YR 5/4) sandy loam; weak fine subangular blocky structure; very friable; common fine roots; many pale brown (10YR 6/3) uncoated sand grains; strongly acid; clear wavy boundary.

C2—18 to 38 inches; yellowish brown (10YR 5/4) loamy sand; single grained; very friable; few fine roots; few thin strata of brown (10YR 4/3) sandy loam; few pale brown (10YR 6/3) uncoated sand grains; very strongly acid; clear wavy boundary.

C3—38 to 60 inches; yellowish brown (10YR 5/4) loamy sand; single grained; very friable; many pale brown (10YR 6/3) uncoated sand grains; very strongly acid.

Reaction generally is very strongly acid or strongly acid throughout the profile, but the A horizon is less acid in areas that have been limed. Most pedons have strata of contrasting textures and have an irregular distribution of organic matter. Many pedons have gravelly strata below a depth of 40 inches. In the upper 30 inches, 20 to 50 percent of the effective cation-exchange capacity is occupied by exchangeable aluminum.

The A horizon has hue of 10YR or 7.5YR, value of 3 to 6, and chroma of 2 to 4. The C horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. Some pedons have mottles with hue of 10YR, value of 4 to 6, and chroma of 1 or 2 below a depth of 20 inches. The strata in the C horizon are loamy sand to silty clay loam. The 10- to 40-inch control section averages sandy loam, silt loam, or loam and has less than 18 percent clay and more than 15 percent sand that is coarser than very fine sand.

Olivier Series

The Olivier series consists of somewhat poorly drained, slowly permeable soils that formed in loess. These soils have a fragipan. They are on stream terraces of late Pleistocene age. Slopes range from 0 to 3 percent.

Soils of the Olivier series are fine-silty, mixed, thermic Aquic Fragiudalfs.

Olivier soils commonly are near Calhoun and Dexter soils. Neither Calhoun nor Dexter soils have a fragipan. Calhoun soils are in broad depressional areas and are poorly drained. Dexter soils are on ridges and are well drained.

Typical pedon of Olivier silt loam, 0 to 1 percent slopes; 1 mile southeast of Denham Springs, 2,700 feet south of Interstate 12, and 900 feet east of Grays Creek; Spanish Land Grant sec. 39, T. 7 S., R. 3 E.

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

E—5 to 8 inches; light yellowish brown (10YR 6/4) silt loam; weak fine granular structure; friable; many fine roots; strongly acid; clear wavy boundary.

Bt1—8 to 18 inches; yellowish brown (10YR 5/4) silt loam; common medium faint yellowish brown (10YR 5/6) and common fine distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; common fine roots; few fine pores; few faint clay films on faces of peds; very strongly acid; clear wavy boundary.

Bt2—18 to 23 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct strong brown (7.5YR 5/6) and few medium distinct light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; firm; few fine roots; few distinct clay films on faces of peds; very strongly acid; clear wavy boundary.

Btx1—23 to 39 inches; yellowish brown (10YR 5/6) silty clay loam; moderate very coarse prismatic structure; very firm and brittle; few fine pores; gray (10YR 6/1) seams of silt loam ¼ inch wide between vertical faces of prisms; few distinct clay films on faces of peds; strongly acid; clear wavy boundary.

Btx2—39 to 63 inches; yellowish brown (10YR 5/6) silty clay loam; moderate very coarse prismatic structure; very firm and brittle; few fine pores; gray (10YR 6/1) silt loam seams about ½ inch wide between vertical faces of prisms; few distinct clay films on faces of peds; strongly acid.

The thickness of the solum ranges from 48 to 96 inches. Depth to the fragipan ranges from 18 to 42 inches. Typically, these soils have less than 10 percent sandy material, which is dominantly very fine sand. In the upper 30 inches, at least 50 percent of the effective cation-exchange capacity is occupied by exchangeable aluminum.

The Ap horizon has value of 4 or 5 and chroma of 1 to 3. It ranges from very strongly acid to slightly acid. The E horizon, if it occurs, has value of 5 or 6 and chroma of 2 to 4. It ranges from very strongly acid to medium acid.

The Bt horizon has value of 5 or 6 and chroma of 3 to 8. It is silt loam or silty clay loam. It is very strongly acid or strongly acid. The Btx horizon has value of 4 or 5 and chroma of 3 to 8. It is silt loam or silty clay loam. It ranges from very strongly acid to neutral.

Ouachita Series

The Ouachita series consists of well drained, moderately slowly permeable soils that formed in loamy alluvium. These soils are on flood plains. They are frequently flooded. Slopes range from 1 to 3 percent.

Soils of the Ouachita series are fine-silty, siliceous, thermic Fluventic Dystrochrepts.

Ouachita soils commonly are near Cahaba, Dexter, Guyton, and Ochlockonee soils. Cahaba and Dexter soils are on stream terraces. They have a reddish subsoil. Guyton soils are lower on the landscape than the Ouachita soils and are poorly drained. They are grayish throughout. Ochlockonee soils are in landscape positions similar to those of the Ouachita soils. They are coarse-loamy.

Typical pedon of Ouachita silt loam, in an area of Ouachita, Ochlockonee, and Guyton soils, frequently flooded; 1.5 miles north of Plainview, 600 feet east of the Amite River, and 500 feet west of Louisiana Highway 1032; Spanish Land Grant sec. 64, T. 6 S., R. 2 E.

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

Bw1—5 to 12 inches; yellowish brown (10YR 5/4) silt loam; weak medium subangular blocky structure; friable; few fine roots; extremely acid; clear smooth boundary.

Bw2—12 to 32 inches; dark yellowish brown (10YR 4/4) silty clay loam; few fine faint yellowish brown mottles; moderate medium subangular blocky structure; friable; few fine roots; extremely acid; clear wavy boundary.

Bw3—32 to 60 inches; yellowish brown (10YR 5/4) silt loam; weak medium subangular blocky structure; friable; few fine roots; few fine black stains; extremely acid.

The thickness of the solum ranges from 40 to 80 inches. The content of organic matter decreases irregularly with increasing depth. In the upper 30 inches, at least 50 percent of the effective cation-exchange capacity is occupied by exchangeable aluminum.

The Ap horizon has value of 4 and chroma of 2 to 4 or value of 5 and chroma of 3. It is 1 to 6 inches thick. It generally is very strongly acid or strongly acid, but it is less acid in areas that have been limed.

The Bw horizon has value of 4 or 5 and chroma of 3 to 8 or value of 6 and chroma of 3. It is silt loam, loam, silty clay loam, or clay loam. It ranges from extremely acid to strongly acid.

Some pedons have a 2Ab or 2Egb horizon. These horizons vary in texture and color. They are silt loam, sandy loam, or loamy sand. They range from extremely acid to strongly acid.

Some pedons have a 2C horizon. This horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 2 or hue of 10YR, value of 5, and chroma of 3 to 6. It is fine sandy loam, loam, or silt loam. It ranges from extremely acid to strongly acid.

Satsuma Series

The Satsuma series consists of somewhat poorly drained, slowly permeable soils that formed in a mantle of silty material and in the underlying loamy deposits of late Pleistocene age. These soils are on stream or marine terraces. Slopes range from 1 to 3 percent.

Soils of the Satsuma series are fine-silty, siliceous, thermic Glossaquic Hapludalfs.

Satsuma soils commonly are near Abita, Cahaba, Dexter, Gilbert, and Olivier soils. Abita soils are in landscape positions similar to those of the Satsuma soils. They have an argillic horizon that is thicker than that of the Satsuma soils. Cahaba and Dexter soils are higher on the landscape than the Satsuma soils and are well drained. They have a reddish subsoil. Gilbert soils are on broad flats, in depressions, and along drainageways and are poorly drained. They are grayish throughout. Olivier soils are in landscape positions similar to those of the Satsuma soils. They have a fragipan.

Typical pedon of Satsuma silt loam, 1 to 3 percent slopes; 1.75 miles southeast of Watson, 0.25 mile north of Louisiana Highway 1024, and 0.65 mile west of Molar Creek; sec. 32, T. 5 S., R. 3 E.

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable; many fine roots; very strongly acid; abrupt smooth boundary.

EB—4 to 12 inches; light yellowish brown (10YR 6/4) silt loam; weak fine subangular blocky structure; friable; common fine and medium roots; many fine black and brown concretions; strongly acid; clear wavy boundary.

B/E—12 to 18 inches; yellowish brown (10YR 5/6) silty clay loam (Bt) and light gray (10YR 7/2) silt loam (E); common medium distinct light brownish gray (10YR 6/2) mottles; weak fine and moderate medium subangular blocky structure; friable (E) and firm (Bt); common fine and medium roots; many fine pores; interfingers of silt loam (E) between peds make up about 15 percent of the horizon; common distinct clay films on faces of peds; many fine black and brown concretions; strongly acid; clear smooth boundary.

Btn—18 to 28 inches; strong brown (7.5YR 5/8) silty clay loam; common medium prominent red (2.5YR 4/6) and grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; firm; few fine roots; common distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

2Btnx1—28 to 35 inches; yellowish brown (10YR 5/6) clay loam; many medium distinct grayish brown (10YR 5/2) mottles; weak medium subangular blocky structure; friable; about 15 percent, by volume, firm and brittle bodies; few fine roots; many fine pores; common distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

2Btnx2—35 to 50 inches; strong brown (7.5YR 5/8) loam; common medium prominent grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; friable; about 35 percent, by volume, very firm and brittle bodies; many fine pores; few faint clay films on faces of peds and in pores; strongly acid; gradual wavy boundary.

2BCn—50 to 65 inches; strong brown (7.5YR 5/8) loam; many medium prominent grayish brown (10YR 5/2) mottles; weak coarse subangular blocky structure; friable; strongly acid.

The thickness of the solum ranges from 30 to 70 inches. In the upper 30 inches, at least 50 percent of the effective cation-exchange capacity is occupied by exchangeable aluminum.

The Ap horizon has value of 3 to 5 and chroma of 1 to 3. Where the value is 3, this horizon is less than 6 inches thick. It ranges from very strongly acid to medium acid.

Some pedons have an E horizon. This horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 8. It has few to many mottles in shades of brown or gray. It ranges from very strongly acid to medium acid.

Some pedons have an EB horizon or a BE horizon. These horizons have value of 5 or 6 and chroma of 4 to 8. They range from very strongly acid to medium acid.

The Bt part of the B/E horizon and the Btn horizon have hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 3 to 8. They are mottled in shades of brown, gray, or red. They have few to many mottles with chroma of 2 or less. They are silty clay loam or silty clay. They range from very strongly acid to medium acid.

The 2Btnx and 2BCn horizons have the same range in color as the Btn horizon. They range from very strongly acid to neutral. They are silty clay loam, clay loam, silt loam, or loam. Firm and brittle bodies make up 10 to 40 percent of the horizontal cross sections of the 2Btnx horizon.

Some pedons have a 2C horizon. This horizon has the same range in color as the 2Btnx and 2BCn horizons. It is loam or sandy loam. It ranges from very strongly acid to neutral.

Springfield Series

The Springfield series consists of poorly drained, slowly permeable soils that formed in loamy and clayey sediments of late Pleistocene age. These soils are on low, broad stream or marine terraces. Slopes range from 0 to 2 percent.

Soils of the Springfield series are fine, mixed, thermic Aeric Albaqualfs.

Springfield soils commonly are near Colyell, Deerford, Encrow, Olivier, and Verdun soils. All of these soils, except for Encrow soils, are somewhat poorly drained and are higher on the landscape than the Springfield soils. Encrow soils are slightly lower on the landscape than the Springfield soils. Colyell and Encrow soils do not have an abrupt change in texture between the albic and argillic horizons. Deerford and Verdun soils are fine-silty and have a high content of sodium in the subsoil. Olivier soils are fine-silty and have a fragipan.

Typical pedon of Springfield silt loam; 0.5 mile southwest of Frost and 100 feet north of Louisiana Highway 42; NW¼ sec. 31, T. 7 S., R. 5 E.

A—0 to 3 inches; grayish brown (10YR 5/2) silt loam; common fine distinct dark yellowish brown (10YR 4/4) mottles; weak fine granular structure; friable; very strongly acid; clear smooth boundary.

Eg1—3 to 10 inches; light brownish gray (10YR 6/2) silt loam; common fine distinct yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; friable; many fine pores; very strongly acid; clear smooth boundary.

Eg2—10 to 13 inches; light gray (10YR 7/2) silt loam; few peds of yellowish brown (10YR 5/6) silt loam; weak coarse subangular blocky structure; friable; many fine pores; very strongly acid; abrupt wavy boundary.

Btg—13 to 20 inches; grayish brown (2.5Y 5/2) silty clay; common fine prominent reddish brown (5YR 4/4) mottles; weak medium subangular blocky structure; very firm; many distinct clay films on faces of peds; distinct silt coatings less than 1 millimeter thick on faces of peds in the upper inch; very strongly acid; gradual smooth boundary.

Bt1—20 to 31 inches; yellowish brown (10YR 5/4) silty clay loam; common fine distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 5/8) mottles; moderate coarse subangular blocky structure parting to weak fine prismatic; very firm; few distinct dark gray (10YR 4/1) clay films on faces of peds; a few iron-manganese streaks; strongly acid; gradual smooth boundary.

Bt2—31 to 60 inches; yellowish brown (10YR 5/4) silty clay loam; common fine distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 5/8) mottles; weak coarse subangular blocky structure; firm; few distinct clay films on faces of peds; neutral.

The thickness of the solum ranges from about 30 to 60 inches. In the upper 30 inches, at least 50 percent of the effective cation-exchange capacity is occupied by exchangeable aluminum.

The A horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 to 3. The Eg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. The A and Eg horizons range from very strongly acid to medium acid. The boundary between the Eg and Btg horizons is wavy or smooth.

The Btg horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2. It has few to many mottles in shades of brown or red. It is clay or silty clay. It ranges from very strongly acid to medium acid. The Bt and BC horizons have hue of 10YR or 2.5Y and chroma of 3 to 6. They are silty clay loam or silt loam. They range from strongly acid to moderately alkaline.

Stough Series

The Stough series consists of somewhat poorly drained, moderately slowly permeable soils that formed in loamy deposits high in content of sand. These soils are on broad, slightly convex ridges on stream or marine terraces of late Pleistocene age. They are subject to rare flooding. Slopes are 0 to 1 percent.

Soils of the Stough series are coarse-loamy, siliceous, thermic Fragiaquic Paleudults.

Stough soils commonly are near Guyton, Myatt, and Satsuma soils. Guyton and Myatt soils are lower on the landscape than the Stough soils and are poorly drained. They are grayish throughout. Satsuma soils are in landscape positions similar to those of the Stough soils. They contain less total sand than the Stough soils.

Typical pedon of Stough fine sandy loam; 5.5 miles northeast of Magnolia, 2,300 feet east of Louisiana Highway 441, and 4,300 feet west of the Tickfaw River; Spanish Land Grant sec. 40, T. 5 S., R. 5 E.

A—0 to 4 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; friable; many fine roots; very strongly acid; abrupt smooth boundary.

E—4 to 7 inches; light yellowish brown (10YR 6/4) fine sandy loam; few fine distinct yellowish brown (10YR 5/6) mottles; weak fine granular structure; friable; common fine roots; few fine black and brown concretions; very strongly acid; clear wavy boundary.

Bt—7 to 14 inches; yellowish brown (10YR 5/4) loam; few fine distinct light gray (10YR 7/2) and common fine distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; few fine roots; few faint clay films on faces of peds; common medium and fine black and brown concretions; strongly acid; clear wavy boundary.

Btx1—14 to 22 inches; yellowish brown (10YR 5/6) loam; common medium distinct light brownish gray (10YR 6/2) and common medium faint yellowish brown (10YR 5/4) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; friable; many distinct clay films on faces of peds; yellowish brown part of the horizon makes up about 40 percent of the volume and is very firm and brittle; common medium and fine black and brown concretions; strongly acid; clear wavy boundary.

Btx2—22 to 31 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium distinct light brownish gray (10YR 6/2) and common medium faint yellowish brown (10YR 5/4) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; friable; common distinct clay films on faces of peds; yellowish brown part of the horizon makes up about 55 percent of the volume and is very firm and brittle; common medium and fine black and brown concretions; strongly acid; clear wavy boundary.

Btx3—31 to 47 inches; mottled yellowish brown (10YR 5/4 and 5/6) and light brownish gray (10YR 6/2) sandy clay loam; weak coarse prismatic structure parting to moderate medium subangular blocky; friable; few distinct clay films on faces of peds; yellowish brown part of the horizon makes up about 55 percent of the volume and is very firm and brittle; strongly acid; clear wavy boundary.

Btx4—47 to 60 inches; mottled yellowish brown (10YR 5/6), light yellowish brown (10YR 6/4), light brownish gray (10YR 6/2), and strong brown (7.5YR 5/6) sandy clay loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; few distinct clay films on faces of peds; yellowish brown part of the horizon makes up about 55 percent of the volume and is very firm and brittle; very strongly acid.

The solum is more than 60 inches thick. Reaction generally is very strongly acid or strongly acid throughout the profile, but the A horizon is less acid in areas that have been limed. In the upper 30 inches, 20 to 50 percent of the effective cation-exchange capacity is occupied by exchangeable aluminum.

The A horizon has value of 3 or 4 and chroma of 1 or

2. It is 3 to 6 inches thick. The E horizon has hue of 10YR or 2.5Y and chroma of 2 to 4. It is fine sandy loam, sandy loam, or loam.

The Bt and Btx horizons have hue of 10YR or 2.5Y and value and chroma of 4 to 6. They have few to many grayish and brownish mottles. The Btx horizon is very firm and brittle in 40 to 55 percent of the volume. The upper 20 inches of the Bt horizon has less than 18 percent clay. The Bt horizon is fine sandy loam, loam, or sandy loam. The Btx horizon is fine sandy loam, loam, sandy loam, or sandy clay loam.

Toula Series

The Toula series consists of moderately well drained soils that formed in a moderately thick silty mantle and in the underlying loamy deposits of Pleistocene age. These soils are on uplands. They have a fragipan. Permeability is slow in the fragipan. Slopes range from 1 to 3 percent.

Soils of the Toula series are fine-silty, siliceous, thermic Typic Fragiudults.

Toula soils commonly are near Bude and Calhoun soils. Bude soils are lower on the landscape than the Toula soils and are somewhat poorly drained. They have grayish mottles within a depth of 16 inches. Calhoun soils are in depressions and along drainageways and are poorly drained. They are grayish throughout and do not have a fragipan.

Typical pedon of Toula silt loam, 1 to 3 percent slopes; 3.4 miles north of Livingston and 100 feet west of a dirt road; SW¼ sec. 13, T. 4 S., R. 4 E.

A—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable; many fine, medium, and coarse roots; medium acid; abrupt smooth boundary.

Bt1—6 to 11 inches; yellowish brown (10YR 5/4) silt loam; weak fine subangular blocky structure; friable; common fine and medium roots; many distinct clay films on faces of peds; few fine black and brown concretions; strongly acid; clear wavy boundary.

Bt2—11 to 25 inches; strong brown (7.5YR 5/6) silty clay loam; common medium distinct yellowish red (5YR 4/6) bodies; weak medium subangular blocky structure; friable; few fine and medium roots; common distinct clay films on faces of peds; few fine black and brown concretions; very strongly acid; clear wavy boundary.

Bt3—25 to 31 inches; yellowish brown (10YR 5/4) silt loam; few medium distinct pale brown (10YR 6/3) and strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; friable; few fine roots; few distinct clay films on faces of peds; few fine black and brown concretions; very strongly acid; clear wavy boundary.

Btx1—31 to 36 inches; brownish yellow (10YR 6/6) silt loam; common brittle bodies of strong brown (7.5YR 5/6) material; weak very coarse prismatic structure; very firm; few fine roots in seams around peds; few distinct clay films on faces of peds; about 15 percent, by volume, light brownish gray (10YR 6/2) seams of silt loam surrounding prisms; few fine black and brown concretions; very strongly acid; gradual wavy boundary.

2Btx2—36 to 49 inches; brownish yellow (10YR 6/6) silt loam; weak very coarse prismatic structure; very firm and brittle; few fine roots in gray seams around peds; few distinct clay films on faces of peds; about 10 percent, by volume, light brownish gray (10YR 6/2) seams of silt loam surrounding prisms; strongly acid; gradual wavy boundary.

2Btx3—49 to 65 inches; yellowish brown (10YR 5/6), brownish yellow (10YR 6/6), and strong brown (7.5YR 5/6) silt loam; weak very coarse prismatic structure; very firm and brittle; few faint patchy clay films on vertical faces of peds; light brownish gray (10YR 6/2) seams of silt loam surrounding peds; very strongly acid.

The solum is more than 60 inches thick. Depth to the fragipan ranges from 18 to 38 inches. The depth to mottles having chroma of 2 or less is typically more than 20 inches but ranges from 17 to 30 inches. Reaction generally ranges from very strongly acid to medium acid throughout the solum, but the A horizon is less acid in areas that have been limed. In the upper 30 inches, at least 50 percent of the effective cation-exchange capacity is occupied by exchangeable aluminum. The content of sandy material in the textural family control section (Bt horizon) typically is less than 15 percent, but it ranges from 5 to 25 percent. Less than 15 percent of the sand in the control section is fine sand or coarser sand.

The A horizon has value of 3 to 5 and chroma of 1 to 4. It is 3 to 7 inches thick. In areas where the value is 3, this horizon is less than 6 inches thick.

Some pedons have a BE horizon. This horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma 3 to 8. It is silt loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. It has few to many mottles in shades of brown or red. In some pedons it also has mottles in shades of gray below a depth of 16 inches.

This horizon is silt loam or silty clay loam.

The Btx and 2Btx horizons have the same range in color as the Bt horizon. They are mottled in shades of brown, gray, or red. The Btx horizon is silt loam or silty clay loam. The 2Btx horizon is silt loam, loam, silty clay loam, sandy clay loam, or clay loam. The content of sandy material in the 2Btx horizon ranges from 20 to 60 percent. The content of clay in the fragipan ranges from 17 to 35 percent.

Some pedons have a 2Bt horizon. This horizon has the same range in color and texture as the 2Btx horizon. The number of brittle bodies in the 2Bt horizon ranges from none to common. These bodies can make up 10 to 40 percent of the matrix, by volume.

Verdun Series

The Verdun series consists of somewhat poorly drained, very slowly permeable soils that have high levels of sodium throughout the subsoil. These soils formed in silty deposits of Pleistocene age. They are on stream or marine terraces. Slopes are less than 1 percent.

Soils of the Verdun series are fine-silty, mixed, thermic Glossic Natraqualfs.

The Verdun soils in Livingston Parish are taxadjuncts because reaction in the A and E/Bg horizons is lower than is definitive for the Verdun series. Also, the family mineralogy control section is siliceous rather than mixed. These differences, however, do not significantly affect the use and management of the soils.

Verdun soils commonly are near Calhoun, Colyell, Deerford, Olivier, and Springfield soils. Calhoun soils are lower on the landscape than the Verdun soils and are poorly drained. They do not have concentrations of sodium in the subsoil. Colyell soils are in the lower landscape positions. They are fine textured. Deerford soils are in landscape positions similar to those of the Verdun soils. They have less than 15 percent exchangeable sodium in the upper part of the subsoil. Olivier soils are slightly higher on the landscape than the Verdun soils. They have a fragipan. Springfield soils are in the lower landscape positions and are poorly drained. They have a fine textured control section.

Typical pedon of Verdun silt loam; 4.8 miles northeast of Port Vincent, 1,000 feet south of a parish road, and 2,400 feet east of Middle Colyell Creek; sec. 33, T. 7 S., R. 4 E.

A—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable; many fine, medium, and coarse roots; dark yellowish brown (10YR 4/4) oxidation stains around roots; strongly acid; clear smooth boundary.

E/Bg—4 to 12 inches; light brownish gray (10YR 6/2) silt loam (E); many medium prominent yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles; weak coarse prismatic structure; friable; about 20 percent, by volume, silty clay loam (Bt); many fine and medium roots; few fine black and brown concretions; medium acid; abrupt irregular boundary.

Btng—12 to 22 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium prominent yellowish brown (10YR 5/6), strong brown (7.5YR 5/6), and red (2.5YR 4/8) mottles; moderate very coarse prismatic structure parting to weak medium subangular blocky; firm; many fine and medium and few coarse roots; common distinct clay films on faces of peds; tongues of light brownish gray (10YR 6/2) silt loam (E) about 1 inch wide between prisms; few black stains; moderately alkaline; clear smooth boundary.

Btn1—22 to 31 inches; yellowish brown (10YR 5/4) silty clay loam; common medium distinct yellowish brown (10YR 5/8) mottles; distinct pale brown (10YR 6/3) silt coatings on faces of peds; moderate very coarse prismatic structure parting to weak moderate subangular blocky; firm; common medium black and brown concretions; common distinct clay films on faces of peds; common fine, medium, and coarse roots; mildly alkaline; gradual wavy boundary.

Btn2—31 to 45 inches; yellowish brown (10YR 5/4) silty clay loam; common medium distinct yellowish brown (10YR 5/8) mottles; distinct pale brown (10YR 6/3) silt coatings on faces of peds; weak coarse prismatic structure parting to weak medium subangular blocky; firm; few coarse and medium roots; few distinct clay films on faces of peds; few medium black and brown concretions; moderately alkaline; gradual wavy boundary.

Btn3—45 to 60 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct yellowish brown (10YR 5/8) and few medium distinct light brownish gray (10YR 6/2) mottles; weak coarse prismatic structure parting to weak medium subangular blocky; firm; few coarse roots; few distinct clay films on faces of peds; strongly alkaline; gradual wavy boundary.

Cnk—60 to 70 inches; yellowish brown (10YR 5/4) silt loam; many medium distinct light brownish gray (10YR 6/2) mottles; massive; firm; many medium concretions of calcium carbonate; strongly alkaline.

The thickness of the solum ranges from 30 to more than 60 inches. The content of exchangeable sodium ranges from 15 to 50 percent throughout the subsoil.

The A horizon has value of 3 to 5 and chroma of 2 or 3. It ranges from extremely acid to mildly alkaline. The E part of the E/Bg or B/E horizon has value of 5 or 6 and chroma of 1 or 2. It ranges from medium acid to moderately alkaline.

The Btng horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3; hue of 10YR, value of 4, and chroma of 1; or hue of 2.5Y, value of 5, and chroma of 2. It has few to many mottles in shades of brown, yellow, or red. It ranges from neutral to moderately alkaline.

The Btn horizon has value of 4 or 5 and chroma of 3 to 6. It has few to many mottles in shades of gray and brown. It ranges from neutral to strongly alkaline. The number of carbonate concretions in this horizon ranges from none to common.

The Cnk horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 to 6. It is silt loam or silty clay loam. It ranges from neutral to strongly alkaline. The number of carbonate concretions in this horizon ranges from none to common.

Formation of the Soils

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This section explains soil genesis and the processes and factors of soil formation as they relate to the soils of Livingston Parish.

Genesis of the Soils

Soil genesis is the phase of soil science that deals with the processes and factors of soil formation *(6)*. It is the study of the formation of soils on the land surface and of changes in soil bodies. It is the science of the evolution of soils that are conceived of as natural units *(12, 29)*.

Internal and external forces influence soils. Generally, the internal forces are synonymous with soil-forming processes and the external forces are synonymous with soil-forming factors. Soils generally are perceived to be a stable component of our environment; unless the soils are disturbed, they show very little change. Soil scientists, however, view soils as a dynamic system and can observe minute but important changes in the composition of the soil, depending upon when and how samples are taken *(21)*. The following information can give a better understanding of how the soil survey can be used and how interpretations can be derived from it.

Processes of Soil Formation

The complex soil-forming processes are the gains, losses, translocations, and transformations that occur in the soil. These also influence the kind and degree of development of soil horizons *(31)*. Soil-forming processes result in either additions to or losses from the soil of organic, mineral, and gaseous materials; translocations of materials from one point to another within the soil; and physical and chemical transformations of mineral and organic materials within the soil.

The addition of organic material to the soil is an important process that occurs to some extent in all soils. However, more organic matter accumulates in some soils than in others. Organic matter increases the available water and cation-exchange capacities of the soil, helps granulate the soil, and releases plant nutrients in the soil. Organic matter accumulates mainly in and above the surface horizon; consequently, the surface horizon is higher in organic matter content and is darker than the lower horizons. The accumulations of organic matter are significant only in the Barbary and Maurepas soils in Livingston Parish. On most of the other soils in the parish, accumulated organic matter has only slightly darkened the surface layer.

Leaving crop residue and allowing leaf litter and other organic material to accumulate on the surface will maintain or increase the content of organic matter in the soil. Living organisms, through their activities, decompose these accumulations and mix them into the soil. Increasing the content of organic matter in the soil helps to control erosion.

The addition of mineral material on the surface has been important in the formation of some soils in Livingston Parish. The added material, generally in the form of alluvium, provides new parent material in which the processes of soil formation can occur. In many cases, new material has accumulated faster than the processes of soil formation could appreciably alter the material. As a result, depositional strata formed in the lower horizons of many of the alluvial soils. Even though most of the soils in Livingston Parish are alluvial, these depositional strata are evident only in the Barbary, Ochlockonee, and Ouachita soils. These soils have been forming in recent or relatively young alluvial sediments. Liquids or gases added to the soil are generally compounds of nitrates and sulfates dissolved or trapped in rainwater.

The loss of components from the soil is also important in the overall process of soil development, although it is generally less noticeable than the addition of materials to the soils during soil formation. For example, as organic matter is decomposed, carbon dioxide is emitted into the atmosphere. Water also escapes from the soil by evaporation and transpiration from plants. On some soils, erosion has removed both mineral and organic materials. These losses are natural, to some extent, but in some places they are accelerated by human activities. In Livingston Parish, moving water is the greatest cause of erosion.

Leaching removes many water soluble compounds and elements from the soil. Water moving through the soil carries these soluble elements out of the soil. In many soils, the soluble elements have been moved completely out of the soil profile. Loamy soils, such as the Cahaba, Dexter, Ochlockonee, and Ouachita soils, are permeable, and most soluble bases are leached in a relatively short time. The more clayey soils are less permeable, and slowly moving water leaches smaller amounts of soluble elements. In some pedons of the Deerford and Verdun soils, most of the free carbonates have been leached from the upper part of the profile to the lower part. In areas where rainfall is sufficient, however, the soluble elements have been completely leached out of the profile of these less permeable soils. Relatively young soils that were initially high in bases show the least amount of leaching.

The translocation of material in the soil, either in eluviation or illuviation, has been an important process in the development of most of the soils in the parish. Eluviation is the moving of solids out of part of the soil profile, and illuviation is the moving of solids into a lower part of the soil profile. In soils that have large pores, soil material that is small enough to go through these pores can be suspended in water as it moves downward. Clay particles, because of their small size, move downward in this manner. The translocation and accumulation of clay in the profile is evident in most of the soils in Livingston Parish.

In many soils in the parish, iron and manganese move to and accumulate in the lower part of the profile. These accumulations result from alternating oxidizing and reducing conditions related primarily to the fluctuations of water-saturated zones within the soils. Reduction occurs when water saturates the soil for relatively long periods and when low amounts of oxygen are in the soil. It results in gray compounds of iron and manganese characteristic of the Btg and BCg horizons in Calhoun and Guyton soils. Prevailing reduced conditions and a fluctuating water table can translocate iron and manganese to a lower horizon and can precipitate them at the top of the saturated zone. Abita, Bude, Colyell, and Stough soils commonly have brownish or reddish mottles in grayish horizons.

The transformation of mineral and organic substances in soils is also a major process of soil formation. Transformation processes include oxidation and reduction, both in alternating cycles; hydration; solution; and hydrolysis. Oxidation is geochemical reduction in well aerated soils and parent material. It is important in Dexter soils. It is the easily recognizable oxidation of the ferrous ion to the ferric ion and is most common in ferrous, iron-rich soils. Ferrous iron, the mineral species of high iron-bearing hornblende and pyroxene of the primary mineral group, is a component of soils that formed in glauconite or siderite.

Hydration occurs when water molecules or hydroxyl groups are united with minerals without their being a part of the mineral itself. It generally occurs on the surfaces or edges of mineral grains or, partly, as the structure in simple salts. For example, after hydration, anhydrite mineralizes. Gypsum is commonly in clayey soils that contain sulfate, presumably from marine sediments, and calcium, either from marine sediments or mineral weathering. Few, if any, of the soils in Livingston Parish contain gypsum.

Hydrolysis is the chemical reaction of the hydrogen ion with individual elements within crystal structures. The highly reactive hydrogen ion replaces one of the basic ions in the structure of the mineral. Hydrolysis generally is the most important chemical weathering process; it completely disintegrates primary minerals in all soils, thus making plant nutrients available to plants.

Solution is the simple process of water as the dissolving agent of salts, such as carbonates and sulfates. In solution, salts move through the soil and are either removed from the soil profile or deposited at a lower depth.

Fragipans formed in soils through chemical reactions, physical reactions, or both. Fragipans are dense, brittle layers in the subsoil of some soils, such as Bude, Olivier, and Toula soils. The material in fragipans has many vesicular pores and restricts water movement.

Factors of Soil Formation

External factors control the character and development of soils *(15)*. These factors are important in understanding soil genesis. They may be an agent, force, condition, relationship, or a combination of these that influences parent material *(12)*. The five factors of soil formation are climate, organisms, parent material, relief, and time *(19)*. They determine the characteristics of the soil, but not in terms of processes, causes, or forces active in the system. They can vary either singly or collectively.

Climate

Detailed information on the climate in Livingston

Parish is given in the section "General Nature of the Parish."

Rainfall and temperature are the most commonly measured features of climate and have been the most closely correlated to soil properties *(12)*. Although average climatic conditions are often given for a region, the extremes of climate in that region may have more influence in the development of certain soil properties. Rainfall and temperature can change, depending upon the relief or elevation within a general area.

Rainfall is relatively uniform throughout Livingston Parish. Major differences within the soils in the parish are not a result of variances in rainfall amounts. Cahaba and Stough are some of the most highly leached soils, but they are different because they have different parent material. The solubility of elements in minerals increases as the temperature rises in summer. When temperatures are below freezing, the physical action of water, primarily in the form of ice, plays an important role in the physical destruction of the soil. This process has minimal influence in Livingston Parish, however, which does not experience extremely cold conditions. To a degree, the intensity and annual distribution of rainfall are more important than the absolute amount of rainfall. Rainfall in the parish is not equally distributed throughout the year, and some storms are severe. The intensity of rainfall has an effect on the type and rate of reactions.

Water erodes and deposits soil material, but its most important functions are within the soil profile. Some morphological characteristics result from excessive or inadequate amounts of water. In soils that are highly leached and acid, excessive amounts of water are indicated by grayish colors in the profile. The gray color is caused by reduction. Inadequate amounts of water are indicated by the tendency of very clayey soils to shrink as they dry and swell when they become wet.

Temperature is considered an independent soil-forming factor that influences reactions in the soil-forming process. It is the driving force in most models of evapotranspiration. The combination of evapotranspiration and uneven rainfall distribution is perhaps the most important climatic factor in the soil-forming process. For every 10-degree rise in temperature, the speed of a chemical reaction increases by a factor of 2 to 3 *(40)*. Solar radiation generally increases with increasing elevation. It increases at the most rapid rate in the lower, dust-filled layers of the air. The absorption of solar radiation at the surface is affected by many variables, such as soil color, plant cover, and aspect. South-facing slopes are always warmer than north-facing slopes. Temperature, unlike solar radiation, generally decreases with increasing elevation. The changes in elevation in Livingston Parish are not sufficient to have a significant effect on the mean annual soil temperature.

Organisms

The effect of organisms as a soil-forming factor is indicated by the presence or absence of major horizons in the soil profile. Properties associated with living organisms also are important to soil formation. For example, living organisms play a significant role in the cycling of carbon.

The carbon cycle takes place mainly in the biosphere. In photosynthesis the sun's energy, in the form of carbon, produces organic material. Nitrogen, a major plant nutrient, is used in photosynthesis to produce organic material. As organic matter decomposes, it releases nitrogen for plant use and returns carbon dioxide directly to the atmosphere. Humus, a somewhat resistant organic material, stays in the soil. Because of its size and chemical composition, humus increases infiltration, available water capacity, and cation-exchange capacity and the absorption and storage capabilities of such nutrients as calcium, magnesium, and potassium. It also improves soil tilth.

The natural vegetation in Livingston Parish is quite diverse. The low flats and drainageways are primarily in hardwoods. The gently sloping areas are in mixed hardwoods and pine, and areas on the upper slopes and ridges are in pine and a few hardwoods. In soils with the same parent material, generally the reaction of soils in areas of hardwoods is slightly higher than that of soils in areas of pine. Soils that formed under hardwoods, pines, and mixed pines and hardwoods generally are thicker in the eluvial horizon than those that formed under prairie vegetation. In soils that developed under grass, the surface horizon is generally thicker and has more organic matter than in those that formed under pine or under mixed hardwoods and pine. The amount of organic matter accumulated in the soils depends on other factors, such as temperature and rainfall. Under optimal conditions for microbial activity, the production and decomposition of organic matter are in equilibrium. Accumulation of organic matter will not occur without a change in the factor controlling the equilibrium. The content of organic matter increases when its annual production is high and conditions are not favorable for its decomposition. In Livingston Parish, most soils exist in an ecosystem in which the rate of decomposition of organic matter exceeds the ability of the vegetation to return organic matter to the soils; therefore, the soils are low in organic matter. Barbary and Maurepas soils, however, are in swamps and are continuously saturated; therefore, organic matter decomposes (oxidizes) slowly in these soils.

Parent Material

Parent material has been defined as "the state of the soil system at time zero of soil formation" *(19)*. It is that physical body and its associated chemical and mineralogical properties at the starting point that are changed by the other soil-forming factors over time. The influence of parent material on soil properties is greater on the younger soils than on the older soils. For example, the young Ochlockonee soils exhibit more properties associated with the initial deposits than the much older Abita soils, which may have very few properties in common with the initial parent material. In weathered soils, however, the influence of the parent material may be visible and the parent material can still be an independent factor in soil formation. The nature of the parent material can be expressed in the color, texture, and mineralogy of the soils. These properties can be related to physical and chemical properties, such as heat absorption, susceptibility to erosion, shrink-swell potential, and cation-exchange capacity. The characteristics associated with parent material in the parish are described in the section "Landforms and Surface Geology."

Relief

The relief in Livingston Parish ranges from low on flood plains to moderate in the uplands. Relief associated with the physiographic and geologic units within the parish is described in more detail in the section "Landforms and Surface Geology."

Relief and the geologic physiographic units influenced soil formation as a result of their effects on drainage, runoff, and erosion. Within specific geographic regions, several soil properties associated with relief are depth of the solum, thickness of the A horizon and its content of organic matter, wetness or dryness, color of the profile, degree of horizon differentiation, soil reaction, and content of soluble salts.

Relief also affects the moisture relationships in the soil, either in the form of ground water or in the amount of water available for photosynthesis. The water table is closer to the surface in depressions than on high points on the landscape. In soils with the same parent material, the seasonal high water table is more commonly close to the surface in soils on areas of low relief than in soils on convex landscapes. If the parent material is clayey and has low relief, the soils on ridgetops may be the wettest on the landscape.

Time

When considering soil formation, a pedologist normally does not think in terms of depth in inches or centimeters but rather in terms of horizons, sola, and profile development. Rather than absolute time, the rate of change is what affects soil properties. Time as a rate of change can be described in terms of relative stages of development, absolute dating of horizons and profiles, the rate of soil formation, and the relation to the age and slope of the landform and associated weathering complex *(16, 18)*.

Several hypotheses or models in regard to time have been developed. The hypothesis of the continuous steady state system determined that time is uninterrupted and soil development begins at time zero *(7, 20)*. The continuous steady state model shows that once a process or feature has begun, it continues to develop over time until one of the soil-forming factors greatly changes. Assuming no major change, the morphological feature in time would develop to the maximum extent without giving way to other features. At time zero, for example, the Ochlockonee soils have no subhorizons. As the processes of soil development begin, a cambic horizon forms. In the steady state concept, this horizon would develop over time until it reached its maximum. According to this theory, no additional change takes place in the other soil-forming processes and time is the only thing that changes. Because soils represent a dynamic system, however, the continuous steady state hypothesis probably errs in the way it relates time to pedogenic development.

Another hypothesis of soil formation is the sequential model *(5, 13)*. In this model all stages of soil development operate concurrently. Some processes of soil development proceed so slowly that they have very little effect, whereas others are so rapid that they determine the dominant features of the soil. As long as the relative rates of the process continue unchanged, a given set of properties expresses soil development. The sequential model, sometimes referred to as polygenesis, has two major characteristics. First, a soil morphological entity may be a consequence of a combination of several genetic factors. Second, the morphological expression of soil processes may be a result of several pathways. For example, a given soil begins to form in loamy parent material on gently sloping uplands covered with pine forest under a climate similar to that of the present. A darkened surface horizon may form because of the accumulation of organic carbon. Subsequently, an E horizon and an argillic horizon may form. The result is a soil similar to the Abita soils. As long as the parent material, climate, organisms, and relief did not change substantially over time, the soil would have formed sequentially. The factors, however, possibly could have changed. When some major factor changes, time as a factor of soil formation returns to zero. Because the changes made in a soil by any particular factor remain even after that factor changes, the total amount of time that the factors of soil formation were acting on the soil might not appear to differ from one soil to another.

Several methods can be used to determine the actual age of soils. Morphological properties, however, are most commonly used as a basis for dating the soils. For example, the Olivier soils, which have a thick E horizon, would normally be considered older than the Dexter soils, which have a relatively thin E horizon. Other factors, however, such as parent material, climate, and living organisms, also are important in determining horizon thicknesses. Although geology can indicate in gross terms the relative age of the soil, pedogenic time returns to zero each time major or catastrophic events affect the landscape. These events generally begin a major geologic period.

The rate of change in weathering decreases over time *(14)*. It becomes constant only when the soil material has been weathered to the maximum extent possible under the effects of a given combination of soil-forming factors. Soil formation is seldom a uniform process over time. Minor fluctuations can constantly readjust the environmental conditions in the system. The relative ages of the soils and their parent materials are described in the section "Landforms and Surface Geology."

Landforms and Surface Geology

Whitney J. Autin, Louisiana Geological Survey, prepared this section.

Livingston Parish covers about 665 square miles in the southeastern part of Louisiana. Tangipahoa Parish borders Livingston Parish on the east, and St. Helena Parish borders it on the north. East Baton Rouge, Ascension, and St. John the Baptist Parishes border it on the west and south.

Livingston Parish is drained by the Amite, Tickfaw, and Natalbany Rivers, which flow southward and eventually empty into Lake Maurepas along the southeastern boundary of the parish. Many smaller streams, which originate in the parish, join these larger rivers. Elevations range from near sea level at Lake Maurepas to about 110 feet on the highest interfluves in the northern part of the parish.

The four general physiographic regions in the parish are characterized by soils that formed in different kinds or ages of parent material. These regions are the Intermediate Terraces, Prairie Terraces, Holocene alluvial valleys, and coastal swamps.

Intermediate Terraces. This physiographic region is in a belt along the northern part of Livingston Parish. It is part of a regional, coast-trending terrace that extends across southern Louisiana *(32)*. Some areas of the Intermediate Terrace correspond to the Calhoun-Toula-Bude general soil map unit.

In Livingston Parish, the Intermediate Terraces are nearly level to gently sloping uplands. Elevations range from about 60 to 110 feet. Streams have slightly dissected the surface of the terrace. Local relief ranges from 25 to 50 feet. Nearly level surfaces are on some of the larger interfluve areas.

Field investigations during the course of this survey revealed a consistent relationship between the stratigraphic units at or near the surface and the soils mapped. The surface deposits consist of relatively thin deposits of Peoria loess, deposited from 22,000 to 9,000 years ago, and Sicily Island loess, deposited from 95,000 to 75,000 years ago *(26)*. They have a combined thickness of about 3 feet. The loess overlies loamy to clayey sediments of mid- to late-Pleistocene age. Pedogenic processes mixed the loess with the underlying sediments to form the parent material of the Calhoun, Toula, and Bude soils. The pre-loess sediments are considered to have been part of the Montgomery Formation *(17)*. Though not exposed as a surface soil anywhere in Livingston Parish, a distinct soil profile is at the top of this pre-loess sediment sequence. These sediments are probably a combination of fluvial and slope deposits. More information on the parent material of the soils in the parish is provided in the section "Formation of the Soils."

Prairie Terraces. This landform makes up the majority of the land area of Livingston Parish. It is part of an extensive regional coast-trending terrace that extends across southern Louisiana *(32)*. The terrace locally extends up the valleys of principal rivers of the parish, such as the Amite, Tickfaw, and Natalbany Rivers. These rivers drain land to the north that is older than the Prairie Terrace. Areas of the Prairie Terraces correspond to the general soil map units grouped as soils on stream or marine terraces.

The Prairie Terraces are level to gently sloping and range in elevation from 5 to 95 feet. Streams dissect the surface to a minimal extent; however, local escarpments with generally less than 20 feet of relief are adjacent to the principal river valleys. Small streams that originate on the Prairie Terraces drain much of the survey area. The sediments of the Prairie Terraces are of late-Pleistocene age. Loess blankets these sediments; it is thick along the western edge of the parish and is thin to the east.

In field investigations a consistent stratigraphic sequence was found beneath the Prairie Terraces. A clayey strata of undetermined thickness generally occurs within 30 feet of the land surface. Recognizable soil profiles at the top of this strata indicate their past subaerial exposure. The lithologic and pedologic features of this deposit and the pre-loess deposit beneath the Intermediate Terraces are similar, but it is not yet possible to establish a firm correlation.

A sandy fluvial deposit overlies the clayey strata. These sandy strata range from less than 1 foot to more than 20 feet, depending on the position of the ancient streams that deposited this material. The sandy strata are coarser at the base of the deposit and are finer near the top of it. They are the parent material for the Gilbert, Satsuma, Myatt, Stough, and Cahaba soils. Fine-grained deposits filled the low-lying areas on the surface of these deposits; they contain appreciably more silt and clay than the underlying deposits. These fine-grained deposits are thickest and are nearly continual along the southern edge of the Prairie Terraces, but locally they extend northward along some areas of the sandy deposits. These deposits are the parent material of the Deerford, Verdun, Brimstone, and Gilbert soils. They are likely in an area where fluvial and coastal environments once merged.

In some large areas of the Prairie Terraces, soils formed in thin deposits of silty, mixed loess over clay that overlies sandy sediments. Colyell, Springfield, Encrow, and Abita soils formed in silty materials over clayey materials.

In areas that flank the Amite River, a blanket of Peoria loess, generally 3 to 5 feet thick, covers the Prairie Terraces. The Olivier and Calhoun soils formed in Peoria loess.

Holocene alluvial valleys. Alluvial deposits on the flood plains of the principal rivers and smaller streams are Holocene in age and are less than 10,000 years old. Every year flood plains are subject to repeated flooding, local erosion, and deposition of sediments. Typically, their topography is level to gently undulating. Abandoned stream channels, such as the flood plains of the Amite River, are easily identified in the larger valleys. The Holocene alluvial valleys make up about 10 percent of the land area in the parish and correspond to the Ouachita-Ochlockonee-Guyton general soil map unit. The streams in the parish drain areas of weathered, acid soils, which are the source of the alluvial sediments. As a result, alluvial parent materials are low in weatherable minerals and the soils are naturally low in fertility.

The soils of the alluvial valleys have minimal profile development and are mostly Inceptisols or Entisols. Depositional strata commonly are recognized within 5 feet of the land surface.

Coastal swamps. These swamps are at elevations near sea level. They are along the southern boundary of Livingston Parish near the mouth of the Amite River and the shores of Lake Maurepas.

Coastal swamps make up about 15 percent of the land area in the parish and correspond to the Barbary and Maurepas general soil map units. The surface deposits are of Holocene age and have accumulated since the formation of the Lake Pontchartrain basin. The Lake Pontchartrain basin formed during the last 4,000 years, when the Mississippi River built the distributaries of the St. Bernard Delta south of the lake *(30)*.

Most of the basin is continuously flooded, and the rest is frequently flooded. Most of the sediments in the basin are continuously saturated and have not dried since being deposited. The mineral soils in the swamps commonly are fluid throughout and are classified as Entisols. In places these soils have a thin organic surface layer. The Barbary soils were mapped in the basin. Thick organic deposits are the parent material of the soils called Histosols, such as the Maurepas soils. Where organic and mineral soils meet, interstratified mineral and organic materials are common. In most places alluvium from the Mississippi River or from local streams overlies swamp deposits. In other places Holocene deposits overlie buried surfaces of the Pleistocene terraces.

References

(1) Adams, F. 1984. Soil acidity and liming. Ed. 2, Am. Soc. Agron. Monogr. 12.

(2) American Association of State Highway and Transportation Officials. 1982. Standard specifications for highway materials and methods of sampling and testing. Ed. 13, 2 vols., illus.

(3) American Society for Testing and Materials. 1985. Standard test method for classification of soils for engineering purposes. ASTM Stand. D 2487.

(4) Anderson, A.C., and others. 1936. Soil survey of Livingston Parish, Louisiana. U.S. Dep. Agric., Bur. of Chem. and Soils, 35 pp., illus.

(5) Arnold, R.W. 1965. Multiple working hypothesis in soil genesis. Soil Sci. Soc. Am. Proc. 29: 717-724.

(6) Arnold, R.W. 1983. Concepts of soils and pedology. *In* Wilding, L.P., N.E. Smeek, and G.F. Hall, eds., Pedogenesis and soil taxonomy: concepts and interaction. Elsevier Science Publ., V.B. Amsterdam, The Netherlands, pp. 1-21.

(7) Birkeland, P.W. 1984. Soils and geomorphology. Ed. 2, 372 pp., illus.

(8) Black, C.A. 1968. Soil-plant relationships. 792 pp., illus.

(9) Broadfoot, Walter M., and R.M. Krinard. 1959. Guide for evaluating sweetgum sites. U.S. Dep. Agric., Forest Serv., South. Forest Exp. Stn. Occas. Pap. 176, 8 pp., illus.

(10) Broadfoot, Walter M. 1960. Field guide for evaluating cottonwood sites. U.S. Dep. Agric., Forest Serv. Exp. Stn. Occas. Pap. 178, 6 pp., illus.

(11) Broadfoot, Walter M. 1963. Guide for evaluating water oak sites. U.S. Dep. Agric., Forest Serv., South. Forest Exp. Stn. Res. Pap. S0-1, 8 pp., illus.

(12) Buol, S.W., F.D. Hale, and R.J. McCracken. 1980. Soil genesis and classification. Ed. 2, Iowa State Univ., 404 pp., illus.

(13) Bushnell, T.M. 1943. Some aspects of the soil catena concept. Soil Sci. Soc. Am. Proc. 7: 471-476.

(14) Coleman, S.M. 1981. Rock-weathering rates as function of time. Quant. Res. 15: 250-264, illus.

(15) Crowther, E.M. 1953. The skeptical soil chemist. J. Soil Sci. 4: 107-122.

(16) Davis, W.M. 1899. The geographical cycle. Geogr. J. 14: 481-504, illus.

(17) Fisk, Harold N. 1944. Geological investigation of the alluvial valley of the Lower Mississippi River. U.S. Army, Corps Eng., 78 pp., illus.

(18) Hack, J.T. 1960. Interpretations of erosional topography in humid temperate regions. J. Am. Sci. 258A: 80-97.

(19) Jenny, Hans. 1941. Factors of soil formation. McGraw-Hill Book Company, Inc., 281 pp., illus.

(20) Jenny, Hans. 1961. Derivation of state factor equations of soil and ecosystem. Soil Sci. Soc. Am. Proc. 25: 385-388, illus.

(21) Johnson, W.M. 1963. The pedon and the polypedon. Soil Sci. Soc. Am. Proc. 27: 212-215, illus.

(22) Khasawneh, F.E., E.C. Sample, and E.J. Kamprath, eds. 1980. The role of phosphorus in agriculture. Am. Soc. Agron.

(23) Kilmer, Victor J., S.E. Younts, and N.C. Brady, eds. 1968. The role of potassium in agriculture. Am. Soc. Agron.

(24) Louisiana Agricultural Experiment Station. 1967. Fertilizer recommendations for Louisiana. 24 pp.

(25) Louisiana Cooperative Extension Service. 1986. Louisiana summary agriculture and natural resources. 149 pp.

(26) Miller, B.J., W.J. Day, and B.A. Schumacher. 1986. Loess and loess-derived soils in the Lower Mississippi Valley. *In* Guidebook for soils—Geomorphology tour. Am. Soc. Agron., 144 pp., illus.

(27) Munson, R.D., Ed. 1985. Potassium in agriculture. Am. Soc. Agron.

(28) Page, A.L. 1982. Chemical and microbiological properties. Methods of soil analysis, part 2. Ed. 2, Am. Soc. Agron. Monogr. 9.

(29) Pomerening, J.A., and E.G. Knox. 1962. A test for natural soil groups within the Willamette Catena population. Soil Sci. Soc. Am. Proc. 26: 282-287.

(30) Saucier, Roger T. 1964. Recent geomorphic history of the Pontchartrain Basin. Coastal Stud. Ser., Louisiana State Univ., 114 pp.

(31) Simonson, Roy W. 1959. Outline of a generalized theory of soil genesis. Soil Sci. Soc. Am. Proc. 23: 152-156, illus.

(32) Snead, J.I., and R.P. McCulloh. 1984. Geologic map of Louisiana. Louisiana Geol. Surv., 2 pp.

(33) Stevenson, F.J. 1982. Humus chemistry.

(34) Stevenson, F.J. 1982. Nitrogen in agricultural soils. Am. Soc. Agron. Monogr. 22.

(35) United States Department of Agriculture. 1951. Soil survey manual. U.S. Dep. Agric. Handb. 18, 503 pp., illus.

(36) United States Department of Agriculture. 1975. Forest statistics for Louisiana parishes. Forest Serv., South. Forest Exp. Stn. Resour. Bull., pp. 50-52.

(37) United States Department of Agriculture. 1975. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. Soil Conserv. Serv., U.S. Dep. Agric. Handb. 436, 754 pp., illus.

(38) United States Department of Agriculture. 1984. Procedures for collecting soil samples and methods of analysis for soil survey. Soil Surv. Invest. Rep. 1, 68 pp., illus.

(39) United States Department of Agriculture. 1985. Site index and yield of second growth baldcypress. Soil Conserv. Serv. Tech. Note 5, 2 pp.

(40) Van't Hoff, J.H. 1884. Études de dynamique chimique [studies of dynamic chemistry].

(41) Walsh, L.M., and J.D. Beaton, eds. 1973. Soil testing and plant analysis. Soil Sci. Soc. Am., Madison, Wisconsin.

Glossary

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bottom land. The normal flood plain of a stream, subject to flooding.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Chiseling. Tillage with an implement having one or more soil-penetrating points that 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.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

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.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

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.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:
Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.
Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.
Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.
Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.
Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.
Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.
Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Excess sodium (in tables). Excess exchangeable sodium is in the soil. The resulting poor physical properties restrict the growth of plants.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fine textured soil. Sandy clay, silty clay, and clay.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

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 7.6 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. The major horizons are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

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, any plowed or disturbed surface layer.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) granular, prismatic, or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

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 overlying 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, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Hard, consolidated bedrock beneath the soil. The bedrock 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.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

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 soil is not strong enough to support loads.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark colored, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

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.

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.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of 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 degrees of acidity or alkalinity, expressed as pH values, are—

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.

Rill. A steep-sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Rough. The accumulation of mature living and dead vegetation, especially grasses and forbs, on forest range, marshland, or prairie.

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.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

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.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

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.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

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.

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

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

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

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

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. Generally refers to the layer directly below the surface layer. It can be an A horizon, an E horizon, or both.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from about 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.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

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.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1951-79 at Amite, Louisiana)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January-----	60.5	38.0	49.3	80	16	149	5.42	2.88	7.63	7	0.1
February----	64.5	40.4	52.5	82	20	171	6.04	2.65	8.93	7	0.3
March-------	71.6	47.1	59.4	86	26	310	5.30	2.49	7.72	7	0.0
April-------	79.4	55.6	67.5	89	36	525	6.25	2.47	9.42	5	0.0
May---------	85.7	62.1	73.9	95	44	741	5.34	2.54	7.76	6	0.0
June--------	91.4	67.9	79.7	99	55	891	4.55	1.94	6.77	6	0.0
July--------	92.7	70.8	81.8	100	64	986	7.47	4.65	10.01	11	0.0
August------	92.1	70.3	81.2	98	60	967	4.87	2.81	6.70	8	0.0
September---	88.5	66.4	77.5	96	50	825	5.22	1.96	7.94	7	0.0
October-----	80.8	54.2	67.5	93	33	543	2.61	.51	4.26	3	0.0
November----	70.2	45.5	57.9	86	25	257	4.59	1.66	7.02	6	0.0
December----	63.4	40.0	51.7	82	18	138	5.94	3.34	8.23	7	0.0
Yearly:											
Average---	78.4	54.9	66.7	---	---	---	---	---	---	---	---
Extreme---	---	---	---	101	14	---	---	---	---	---	---
Total-----	---	---	---	---	---	6,503	63.60	51.66	74.96	80	0.4

* 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 degrees F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1951-79 at Amite, 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--	Mar. 1	Mar. 22	Mar. 25
2 years in 10 later than--	Feb. 20	Mar. 12	Mar. 20
5 years in 10 later than--	Feb. 3	Feb. 23	Mar. 10
First freezing temperature in fall:			
1 year in 10 earlier than--	Nov. 19	Nov. 6	Oct. 28
2 years in 10 earlier than--	Nov. 27	Nov. 13	Nov. 2
5 years in 10 earlier than--	Dec. 14	Nov. 26	Nov. 13

TABLE 3.--GROWING SEASON

(Recorded in the period 1951-79 at Amite, Louisiana)

Probability	Daily minimum temperature during growing season		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	279	246	223
8 years in 10	291	256	232
5 years in 10	314	275	247
2 years in 10	336	294	263
1 year in 10	348	304	271

TABLE 4.--SUITABILITY AND LIMITATIONS OF MAP UNITS ON THE GENERAL SOIL MAP FOR MAJOR LAND USES

Map unit	Percent of area	Cultivated crops	Pasture	Woodland	Urban uses	Intensive recreation uses
Calhoun-Toula-Bude	4	Moderately well suited: wetness, flooding, low fertility, slope, potentially toxic levels of exchangeable aluminum.	Calhoun: moderately well suited--wetness, flooding, low fertility. Bude and Toula: well suited.	Toula and Bude: well suited. Calhoun: moderately well suited--wetness, flooding.	Calhoun and Bude:[1] poorly suited--wetness, flooding, restricted permeability, low strength on sites for roads, slope. Toula: moderately well suited.	Calhoun and Bude: poorly suited--wetness, flooding, restricted permeability, slope. Toula: moderately well suited.
Abita-Myatt	1	Abita: well suited. Myatt:[2] moderately well suited--low fertility, wetness, slope, flooding, potentially toxic levels of exchangeable aluminum.	Abita: well suited. Myatt: moderately well suited--wetness, flooding.	Abita: well suited. Myatt: moderately well suited--wetness, flooding.	Abita: moderately well suited--wetness, restricted permeability, moderate shrink-swell potential, low strength on sites for roads. Myatt:[3] poorly suited--wetness, flooding.	Abita: moderately well suited--wetness, slope, restricted permeability. Myatt: poorly suited--wetness, flooding.
Colyell-Springfield-Encrow	28	Colyell and Springfield: moderately well suited--wetness, low fertility, potentially toxic levels of exchangeable aluminum, flooding. Encrow: poorly suited--flooding, wetness.	Colyell: well suited. Springfield and Encrow: generally moderately well suited--flooding, wetness.	Springfield, Encrow, frequently flooded Colyell: moderately well suited--wetness, flooding. Rarely flooded Colyell: well suited.	Poorly suited:[4,5] flooding, wetness, restricted, permeability, high shrink-swell potential, low strength on sites for roads.	Poorly suited:[4] flooding, wetness, restricted permeability.

See footnotes at end of table.

TABLE 4.--SUITABILITY AND LIMITATIONS OF MAP UNITS ON THE GENERAL SOIL MAP FOR MAJOR LAND USES--Continued

Map unit	Percent of area	Cultivated crops	Pasture	Woodland	Urban uses	Intensive recreation uses
Deerford-Verdun-Gilbert------	5	Deerford, Verdun, occasionally flooded Gilbert: poorly suited--low fertility, wetness, flooding, sodium, potentially toxic levels of exchangeable aluminum. Rarely flooded Gilbert: moderately well suited.	Moderately well suited: low fertility, wetness, sodium, flooding.	Deerford and Verdun: poorly suited--wetness, flooding, sodium. Gilbert: moderately well suited.	Poorly suited:[6] flooding, wetness, restricted permeability, low strength on sites for roads, sodium, moderate shrink-swell potential.	Poorly suited: flooding, wetness, restricted permeability.
Gilbert-Satsuma--------------	21	Moderately well suited:[7] wetness, flooding, low fertility, slope, sodium, potentially toxic levels of exchangeable aluminum.	Gilbert: moderately well suited--low fertility, slope, wetness, flooding. Satsuma: well suited.	Gilbert: moderately well suited--wetness, flooding. Satsuma: well suited.	Poorly suited:[6] flooding, wetness, restricted permeability, low strength on sites for roads, moderate shrink-swell potential, slope.	Poorly suited: flooding, wetness, restricted permeability, slope.
Myatt-Satsuma----------------	6	Moderately well suited:[2] wetness, flooding, low fertility, slope, potentially toxic levels of exchangeable aluminum.	Myatt: moderately well suited--slope, wetness, flooding, low fertility. Satsuma: well suited.	Myatt: moderately well suited--wetness, flooding. Satsuma: well suited.	Poorly suited:[3] flooding, wetness, low strength on sites for roads, restricted permeability, moderate shrink-swell potential, slope.	Poorly suited: flooding, wetness, restricted permeability, slope.

See footnotes at end of table.

TABLE 4.--SUITABILITY AND LIMITATIONS OF MAP UNITS ON THE GENERAL SOIL MAP FOR MAJOR LAND USES--Continued

Map unit	Percent of area	Cultivated crops	Pasture	Woodland	Urban uses	Intensive recreation uses
Myatt-Stough	9	Moderately well suited:[2] wetness, flooding, low fertility, potentially toxic levels of exchangeable aluminum, droughtiness.	Myatt: moderately well suited--wetness, flooding, low fertility, droughtiness. Stough: well suited.	Myatt: moderately well suited--wetness, flooding. Stough: well suited.	Poorly suited:[3] flooding, wetness, restricted permeability, low strength on sites for roads.	Myatt: poorly suited--flooding, wetness, restricted permeability, droughtiness. Stough: moderately well suited.
Olivier-Gilbert	3	Moderately well suited:[7] wetness, flooding, low fertility, medium fertility, sodium, slope, potentially toxic levels of exchangeable aluminum.	Olivier: well suited. Gilbert: moderately well suited--wetness, flooding, low fertility.	Olivier: well suited. Gilbert: moderately well suited--wetness, flooding.	Poorly suited:[6] wetness, flooding, low strength on sites for roads, restricted permeability, slope, moderate shrink-swell potential.	Olivier: moderately well suited. Gilbert: poorly suited: wetness, flooding, restricted permeability, slope.
Ouachita-Ochlockonee-Guyton	9	Generally not suited: flooding, wetness.	Poorly suited: flooding, wetness, low fertility.	Moderately well suited: flooding, wetness.	Generally not suited: flooding, wetness.	Generally not suited: flooding, wetness.
Barbary	10	Generally not suited: ponding, low strength.	Generally not suited: ponding, low strength.	Poorly suited: ponding, low strength.	Generally not suited:[8] ponding, low strength, medium subsidence potential, very high shrink-swell potential.	Generally not suited:[8] ponding, low strength, medium subsidence potential.

See footnotes at end of table.

TABLE 4.--SUITABILITY AND LIMITATIONS OF MAP UNITS ON THE GENERAL SOIL MAP FOR MAJOR LAND USES--Continued

Map unit	Percent of area	Cultivated crops	Pasture	Woodland	Urban uses	Intensive recreation uses
Maurepas---------------------	4	Generally not suited: ponding.	Generally not suited: ponding, low strength.	Generally not suited: ponding, low strength.	Generally not suited: ponding, low strength, very high subsidence potential.	Generally not suited: ponding, low strength, very high subsidence potential.

[1] The Calhoun soils that are subject to occasional flooding generally are not suited to use as homesites and are poorly suited to crops.

[2] The Myatt soils that are subject to occasional flooding generally are poorly suited to cultivated crops.

[3] The Myatt soils that are subject to occasional flooding generally are not suited to use as homesites.

[4] The Colyell and Springfield soils that are subject to frequent flooding generally are not suited to cultivated crops, pasture, or for urban and intensive recreation uses because of flooding and the inaccessibility of the individual tracts of land.

[5] The Encrow soils are subject to occasional flooding and generally are not suited to use as homesites.

[6] The Gilbert soils that are subject to occasional flooding generally are not suited to use as homesites.

[7] The Gilbert soils that are subject to occasional flooding generally are poorly suited to cultivated crops.

[8] Subsidence and the very high shrink-swell potential are limitations affecting urban and intensive recreation uses only after the soils are drained.

TABLE 5.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
Ab	Abita silt loam, 1 to 3 percent slopes	2,108	0.4
At	Aquents, dredged	1,751	0.3
BA	Barbary muck	44,710	9.8
Bd	Bude silt loam, 1 to 3 percent slopes	2,507	0.5
Ca	Cahaba fine sandy loam, 1 to 3 percent slopes	1,648	0.3
Ch	Calhoun silt loam	3,930	0.8
Cn	Calhoun silt loam, occasionally flooded	4,256	0.9
Co	Colyell silt loam, 1 to 3 percent slopes	30,333	6.6
Cy	Colyell-Springfield silt loams, frequently flooded	10,980	2.5
Dv	Deerford-Verdun silt loams	17,733	4.0
Dx	Dexter very fine sandy loam, 1 to 3 percent slopes	2,951	0.6
En	Encrow silt loam, occasionally flooded	25,120	5.6
Gb	Gilbert silt loam	22,943	5.1
Ge	Gilbert-Brimstone silt loams, occasionally flooded	38,110	8.4
Gy	Guyton silt loam	834	0.1
MA	Maurepas muck	20,918	4.6
Mt	Myatt fine sandy loam	16,946	3.8
My	Myatt fine sandy loam, occasionally flooded	27,690	6.0
Na	Natalbany silty clay loam, frequently flooded	13,603	3.0
Oe	Olivier silt loam, 0 to 1 percent slopes	3,895	0.8
Or	Olivier silt loam, 1 to 3 percent slopes	4,598	1.0
OU	Ouachita, Ochlockonee, and Guyton soils, frequently flooded	39,189	8.6
Pa	Pits-Arents complex, 0 to 5 percent slopes	1,368	0.3
Sa	Satsuma silt loam, 1 to 3 percent slopes	47,382	10.3
Sp	Springfield silt loam	27,745	6.0
St	Stough fine sandy loam	7,297	1.6
Ta	Toula silt loam, 1 to 3 percent slopes	3,493	0.7
Ve	Verdun silt loam	1,562	0.3
	Water	32,604	7.1
	Total	458,204	100.0

TABLE 6.--PRIME FARMLAND

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name)

Map symbol	Soil name
Ab	Abita silt loam, 1 to 3 percent slopes
Bd	Bude silt loam, 1 to 3 percent slopes
Ca	Cahaba fine sandy loam, 1 to 3 percent slopes
Ch	Calhoun silt loam (if adequately drained)
Co	Colyell silt loam, 1 to 3 percent slopes
Dx	Dexter very fine sandy loam, 1 to 3 percent slopes
Gb	Gilbert silt loam (if adequately drained)
Gy	Guyton silt loam (if adequately drained)
Oe	Olivier silt loam, 0 to 1 percent slopes
Or	Olivier silt loam, 1 to 3 percent slopes
Sa	Satsuma silt loam, 1 to 3 percent slopes
Sp	Springfield silt loam (if adequately drained)
St	Stough fine sandy loam
Ta	Toula silt loam, 1 to 3 percent slopes

TABLE 7.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability	Corn	Soybeans	Common bermudagrass	Improved bermudagrass	Bahiagrass
		Bu	Bu	AUM*	AUM*	AUM*
Ab----------------------- Abita	IIe	55	25	5.0	---	6.5
At**--------------------- Aquents	IIIw	---	---	---	---	---
BA----------------------- Barbary	VIIw	---	---	---	---	---
Bd----------------------- Bude	IIe	80	25	7.0	9.5	9.5
Ca----------------------- Cahaba	IIe	85	30	6.5	9.5	8.0
Ch----------------------- Calhoun	IIIw	---	25	5.0	---	6.5
Cn----------------------- Calhoun	IVw	---	---	4.5	---	5.5
Co----------------------- Colyell	IIe	55	25	5.0	9.0	6.5
Cy----------------------- Colyell-Springfield	Vw	---	---	4.0	---	---
Dv: Deerford----------------	IIIw	---	15	5.0	---	---
Verdun------------------	IIIs	---	15	5.0	---	---
Dx----------------------- Dexter	IIe	75	35	7.0	10.0	9.0
En----------------------- Encrow	IVw	---	---	5.0	---	5.5
Gb----------------------- Gilbert	IIIw	---	20	4.2	---	5.0
Ge----------------------- Gilbert-Brimstone	IVw	---	18	4.6	---	---
Gy----------------------- Guyton	IIIw	---	23	6.5	---	9.5
MA----------------------- Maurepas	VIIIw	---	---	---	---	---
Mt----------------------- Myatt	IIIw	---	25	5.5	---	6.5
My----------------------- Myatt	IVw	---	---	4.5	---	5.5

See footnotes at end of table.

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

Soil name and map symbol	Land capability	Corn	Soybeans	Common bermudagrass	Improved bermudagrass	Bahiagrass
		Bu	Bu	AUM*	AUM*	AUM*
Na------------------------ Natalbany	Vw	---	---	5.0	---	---
Oe------------------------ Olivier	IIw	75	30	5.0	9.0	7.0
Or------------------------ Olivier	IIe	75	30	5.0	9.0	7.0
OU------------------------ Ouachita, Ochlockonee, and Guyton	Vw	---	---	4.5	---	6.0
Pa**---------------------- Pits-Arents	---	---	---	---	---	---
Sa------------------------ Satsuma	IIe	65	25	6.0	9.5	7.5
Sp------------------------ Springfield	IIIw	60	27	5.0	---	6.5
St------------------------ Stough	IIw	80	25	6.0	8.0	8.0
Ta------------------------ Toula	IIe	65	25	6.5	9.5	9.0
Ve------------------------ Verdun	IVs	---	15	4.5	---	---

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available)

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
Ab------------- Abita	11W	Slight	Moderate	Slight	Moderate	Loblolly pine-------	100	11	Loblolly pine, slash pine, sweetgum.
						Slash pine----------	95	12	
						Longleaf pine-------	---	---	
						Sweetgum------------	---	---	
						Southern red oak----	---	---	
						Water oak-----------	---	---	
BA**------------ Barbary	4W	Slight	Severe	Severe	Slight	Baldcypress---------	80	4	Baldcypress.
						Water tupelo--------	60	6	
						Black willow--------	---	---	
Bd------------- Bude	10W	Slight	Moderate	Slight	Severe	Loblolly pine-------	98	10	Loblolly pine, slash pine, sweetgum.
						Slash pine----------	---	---	
Ca------------- Cahaba	9A	Slight	Slight	Slight	Moderate	Loblolly pine-------	87	9	Loblolly pine, slash pine, sweetgum, southern red oak.
						Slash pine----------	91	12	
						Shortleaf pine------	70	8	
						Yellow poplar-------	---	---	
						Sweetgum------------	90	7	
						Southern red oak----	---	---	
						Water oak-----------	---	---	
Ch------------- Calhoun	9W	Slight	Moderate	Moderate	Severe	Loblolly pine-------	90	9	Loblolly pine, slash pine.
						Cherrybark oak------	---	---	
						Water oak-----------	---	---	
						Sweetgum------------	---	---	
						Slash pine----------	90	11	
Cn------------- Calhoun	9W	Slight	Severe	Moderate	Moderate	Loblolly pine-------	90	9	Loblolly pine, slash pine.
						Slash pine----------	90	11	
						Cherrybark oak------	---	---	
						Water oak-----------	---	---	
						Sweetgum------------	---	---	
Co------------- Colyell	13W	Slight	Moderate	Slight	Severe	Slash pine----------	100	13	Loblolly pine, slash pine.
						Loblolly pine-------	100	11	
						Longleaf pine-------	---	---	
						Sweetgum------------	85	6	
						Southern red oak----	---	---	
						Green ash-----------	---	---	
						Water oak-----------	90	6	
Cy**:									
Colyell--------	13W	Slight	Moderate	Moderate	Severe	Slash pine----------	100	13	Loblolly pine, slash pine.
						Loblolly pine-------	100	11	
						Longleaf pine-------	---	---	
						Sweetgum------------	85	6	
						Southern red oak----	---	---	
						Green ash-----------	---	---	
						Water oak-----------	90	6	

See footnotes at end of table.

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

Soil name and map symbol	Ordi-nation symbol	Management concerns: Erosion hazard	Equip-ment limita-tion	Seedling mortal-ity	Plant competi-tion	Potential productivity: Common trees	Site index	Produc-tivity class*	Trees to plant
Cy**:									
Springfield	10W	Slight	Moderate	Moderate	Moderate	Loblolly pine	95	10	Loblolly pine, slash pine.
						Slash pine	95	12	
						Sweetgum	85	6	
						Green ash	---	---	
						Water oak	---	---	
Dv**:									
Deerford	7W	Slight	Moderate	Moderate	Moderate	Sweetgum	86	7	Loblolly pine, slash pine.
						Loblolly pine	92	9	
						Slash pine	92	12	
						Water oak	82	5	
Verdun	7T	Moderate	Moderate	Severe	Slight	Loblolly pine	76	7	Loblolly pine, slash pine.
						Slash pine	76	9	
						Sweetgum	---	---	
						Water oak	---	---	
Dx: Dexter	12A	Slight	Slight	Slight	Moderate	Loblolly pine	110	12	Loblolly pine, slash pine.
						Slash pine	110	14	
						Cherrybark oak	---	---	
						Water oak	---	---	
						Sweetgum	---	---	
En: Encrow	9W	Slight	Moderate	Moderate	Severe	Loblolly pine	90	9	Loblolly pine, slash pine.
						Slash pine	90	11	
						Cherrybark oak	---	---	
						Water oak	---	---	
						Sweetgum	---	---	
Gb: Gilbert	6W	Slight	Severe	Moderate	Severe	Sweetgum	80	6	Sweetgum, water oak, loblolly pine, slash pine.
						Water oak	80	5	
						Loblolly pine	78	8	
						Slash pine	---	---	
Ge**:									
Gilbert	6W	Slight	Severe	Moderate	Moderate	Sweetgum	80	6	Sweetgum, water oak, loblolly pine, slash pine.
						Water oak	80	5	
						Loblolly pine	78	8	
						Slash pine	---	---	
Brimstone	11T	Slight	Severe	Moderate	Moderate	Slash pine	85	11	Slash pine, loblolly pine.
						Loblolly pine	80	8	
Gy: Guyton	9W	Slight	Severe	Moderate	Severe	Loblolly pine	90	9	Loblolly pine, sweetgum, slash pine.
						Slash pine	90	11	
						Sweetgum	---	---	
						Green ash	---	---	
						Southern red oak	---	---	
						Water oak	---	---	
Mt, My: Myatt	9W	Slight	Severe	Severe	Severe	Loblolly pine	88	9	Loblolly pine, slash pine, sweetgum.
						Slash pine	92	12	
						Sweetgum	92	8	
						Water oak	86	6	
						Southern red oak	---	---	
						White oak	---	---	
						American sycamore	---	---	
						Blackgum	---	---	
						Shumard oak	---	---	

See footnotes at end of table.

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

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
Na------------- Natalbany	4W	Slight	Severe	Moderate	Moderate	Water oak---------- Willow oak--------- Swamp tupelo-------- American elm-------- Green ash----------	70 70 --- --- ---	4 4 --- --- ---	Eastern cottonwood, green ash, willow oak, water oak.
Oe, Or---------- Olivier	9W	Slight	Moderate	Slight	Severe	Loblolly pine------- Slash pine---------- Sweetgum----------- Water oak---------- Cherrybark oak------	100 100 85 90 90	9 13 6 6 4	Loblolly pine, slash pine.
OU**:									
Ouachita-------	9W	Slight	Moderate	Slight	Moderate	Loblolly pine------- Sweetgum----------- Eastern cottonwood--	100 100 100	9 10 ---	Loblolly pine, sweetgum, Nuttall oak, yellow poplar, American sycamore, eastern cottonwood.
Ochlockonee----	11W	Slight	Moderate	Moderate	Moderate	Loblolly pine------- Sweetgum----------- Eastern cottonwood--	100 --- ---	11 --- ---	Loblolly pine, sweetgum, Nuttall oak, eastern cottonwood.
Guyton---------	8W	Slight	Severe	Severe	Severe	Loblolly pine------- Sweetgum----------- Green ash---------- Nuttall oak--------- Eastern cottonwood--	80 --- --- --- ---	8 --- --- --- ---	Loblolly pine, sweetgum.
Sa------------- Satsuma	11W	Slight	Moderate	Slight	Severe	Slash pine---------- Loblolly pine------- Longleaf pine------- Sweetgum----------- Southern red oak---- Green ash---------- Water oak----------	90 90 --- 90 --- --- 90	11 9 --- 7 --- --- 6	Loblolly pine, slash pine.
Sp------------- Springfield	10W	Slight	Moderate	Slight	Severe	Loblolly pine------- Slash pine---------- Sweetgum-----------	95 95 85	10 12 6	Loblolly pine, slash pine.
St------------- Stough	9W	Slight	Moderate	Slight	Severe	Loblolly pine------- Cherrybark oak------ Slash pine---------- Sweetgum----------- Water oak----------	90 85 86 85 80	9 7 11 6 5	Loblolly pine, slash pine, sweetgum.
Ta------------- Toula	13A	Slight	Slight	Slight	Moderate	Slash pine---------- Loblolly pine------- Longleaf pine------- Sweetgum----------- Southern red oak---- Green ash----------	100 101 74 --- --- ---	13 11 6 --- --- ---	Loblolly pine, slash pine.

See footnotes at end of table.

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

Soil name and map symbol	Ordi- nation symbol	Management concerns: Erosion hazard	Equip- ment limita- tion	Seedling mortal- ity	Plant competi- tion	Potential productivity: Common trees	Site index	Produc- tivity class*	Trees to plant
Ve--------------- Verdun	7T	Moderate	Moderate	Severe	Slight	Loblolly pine-------	76	7	Loblolly pine, slash pine.
						Slash pine----------	76	9	
						Sweetgum------------	---	---	
						Water oak-----------	---	---	

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--RECREATIONAL DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Ab: Abita	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
At*. Aquents					
BA*: Barbary	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Bd: Bude	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ca: Cahaba	Slight	Slight	Moderate: slope.	Slight	Slight.
Ch, Cn: Calhoun	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Co: Colyell	Severe: flooding, wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Cy*:					
Colyell	Severe: flooding, wetness.	Moderate: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Moderate: wetness, flooding.	Severe: flooding.
Springfield	Severe: wetness, flooding.	Moderate: wetness, percs slowly, flooding.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
Dv*:					
Deerford	Severe: flooding, wetness, excess sodium.	Severe: wetness, excess sodium.	Severe: wetness, excess sodium.	Severe: wetness.	Severe: excess sodium, wetness.
Verdun	Severe: wetness, percs slowly, excess sodium.	Severe: wetness, excess sodium, percs slowly.	Severe: wetness, percs slowly, excess sodium.	Severe: wetness.	Severe: excess sodium, wetness.
Dx: Dexter	Slight	Slight	Moderate: slope.	Slight	Slight.
En: Encrow	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Gb: Gilbert	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
Ge*:					
Gilbert	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
Brimstone	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Gy: Guyton	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
MA*: Maurepas	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
Mt, My: Myatt	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Na: Natalbany	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, flooding, percs slowly.	Severe: wetness.	Severe: wetness, flooding.
Oe, Or: Olivier	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
OU*:					
Ouachita	Severe: flooding.	Moderate: flooding, percs slowly.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
Ochlockonee	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
Guyton	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Pa*:					
Pits.					
Arents.					
Sa: Satsuma	Severe: flooding, wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Sp: Springfield	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

See footnote at end of table.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
St: Stough	Severe: flooding, wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
Ta: Toula	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly, slope.	Moderate: wetness.	Moderate: wetness.
Ve: Verdun	Severe: wetness, percs slowly, excess sodium.	Severe: wetness, excess sodium, percs slowly.	Severe: wetness, percs slowly, excess sodium.	Severe: wetness.	Severe: excess sodium, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--WILDLIFE HABITAT

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

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Ab: Abita	Fair	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
At*. Aquents											
BA*: Barbary	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Fair	Poor	Very poor.	Very poor.	Fair.
Bd: Bude	Fair	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Ca: Cahaba	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Ch: Calhoun	Poor	Fair	Fair	Good	Fair	Good	Good	Good	Fair	Fair	Good.
Cn: Calhoun	Very poor.	Fair	Fair	Good	Fair	Good	Good	Good	Poor	Fair	Good.
Co: Colyell	Fair	Good	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
Cy*:											
Colyell	Fair	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Springfield	Fair	Good	Good	Fair	Good	Good	Fair	Fair	Good	Good	Fair.
Dv*:											
Deerford	Fair	Good	Good	Fair	Good	Fair	Fair	Fair	Good	Good	Fair.
Verdun	Poor	Fair	Fair	Poor	Poor	Fair	Fair	Fair	Fair	Poor	Fair.
Dx: Dexter	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
En: Encrow	Poor	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Gb: Gilbert	Fair	Fair	Fair	Fair	Fair	Good	Good	Good	Fair	Fair	Good.
Ge*:											
Gilbert	Fair	Fair	Fair	Fair	Fair	Good	Good	Good	Fair	Fair	Good.
Brimstone	Fair	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Gy: Guyton	Fair	Fair	Fair	Fair	Fair	Good	Good	Good	Fair	Fair	Good.
MA*: Maurepas	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Fair	Very poor.	Very poor.	Very poor.	Fair.
Mt, My: Myatt	Poor	Fair	Fair	Fair	Fair	Good	Good	Good	Fair	Fair	Good.

See footnote at end of table.

TABLE 10.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Na----------------- Natalbany	Poor	Fair	Fair	Fair	Poor	Fair	Good	Good	Fair	Fair	Good.
Oe, Or------------- Olivier	Fair	Good	Good	Fair	Good	Good	Fair	Fair	Good	Good	Fair.
OU*:											
Ouachita----------	Poor	Fair	Fair	Good	Poor	Fair	Good	Fair	Fair	Good	Fair.
Ochlockonee-------	Poor	Fair	Fair	Good	Good	Fair	Poor	Very poor.	Fair	Good	Very poor.
Guyton------------	Poor	Fair	Fair	Fair	Fair	Poor	Good	Good	Poor	Fair	Good.
Pa*:											
Pits.											
Arents.											
Sa----------------- Satsuma	Fair	Good	Good	Good	Good	Good	Fair	Poor	Fair	Good	Poor.
Sp----------------- Springfield	Fair	Fair	Good	Fair	Good	Good	Good	Good	Fair	Good	Good.
St----------------- Stough	Fair	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Ta----------------- Toula	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Ve----------------- Verdun	Poor	Fair	Fair	Poor	Poor	Fair	Fair	Fair	Fair	Poor	Fair.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--BUILDING SITE DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Ab---------------- Abita	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: low strength.	Moderate: wetness.
At*. Aquents					
BA*--------------- Barbary	Severe: excess humus, ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding.	Severe: ponding.
Bd---------------- Bude	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
Ca---------------- Cahaba	Severe: cutbanks cave.	Slight-----------	Slight-----------	Slight-----------	Slight.
Ch---------------- Calhoun	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness.	Severe: wetness.
Cn---------------- Calhoun	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness.
Co---------------- Colyell	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, low strength.	Moderate: wetness.
Cy*: Colyell-----------	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, shrink-swell, low strength.	Severe: flooding.
Springfield------	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: low strength, flooding.	Moderate: wetness.
Dv*: Deerford---------	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness.	Severe: excess sodium, wetness.
Verdun-----------	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: low strength, wetness.	Severe: excess sodium, wetness.
Dx---------------- Dexter	Severe: cutbanks cave.	Slight-----------	Slight-----------	Severe: low strength.	Slight.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
En----------------- Encrow	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness.
Gb----------------- Gilbert	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness.	Severe: wetness.
Ge*:					
Gilbert-----------	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, low strength, wetness.	Severe: wetness.
Brimstone---------	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, low strength, flooding.	Severe: wetness.
Gy----------------- Guyton	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness.	Severe: wetness.
MA*---------------- Maurepas	Severe: excess humus, ponding.	Severe: ponding, low strength.	Severe: ponding, low strength.	Severe: ponding.	Severe: ponding, excess humus.
Mt----------------- Myatt	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.
My----------------- Myatt	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness.
Na----------------- Natalbany	Severe: wetness.	Severe: flooding, shrink-swell, wetness.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness, flooding.
Oe, Or------------- Olivier	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
OU*:					
Ouachita----------	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Severe: flooding.
Ochlockonee-------	Moderate: wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Guyton------------	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
Pa*:					
Pits.					
Arents.					

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Sa----------------- Satsuma	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength.	Moderate: wetness.
Sp----------------- Springfield	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
St----------------- Stough	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Moderate: wetness, flooding.	Moderate: wetness, droughty.
Ta----------------- Toula	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: low strength.	Moderate: wetness.
Ve----------------- Verdun	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: low strength, wetness.	Severe: excess sodium, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--SANITARY FACILITIES

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Ab: Abita	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: thin layer.
At*. Aquents					
BA*: Barbary	Severe: ponding, percs slowly.	Severe: excess humus, ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
Bd: Bude	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Severe: wetness.	Severe: wetness.	Poor: hard to pack, wetness.
Ca: Cahaba	Slight	Severe: seepage.	Severe: seepage.	Slight	Fair: thin layer.
Ch: Calhoun	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Cn: Calhoun	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Co: Colyell	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Cy*:					
Colyell	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
Springfield	Severe: wetness, percs slowly, flooding.	Severe: flooding.	Severe: wetness, flooding.	Severe: wetness, flooding.	Poor: wetness.
Dv*:					
Deerford	Severe: wetness, percs slowly.	Slight	Severe: wetness, excess sodium.	Severe: wetness.	Poor: wetness, excess sodium.
Verdun	Severe: wetness, percs slowly.	Slight	Severe: wetness, excess sodium.	Severe: wetness.	Poor: wetness, excess sodium.
Dx: Dexter	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: too sandy.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
En------------------ Encrow	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
Gb------------------ Gilbert	Severe: wetness, percs slowly.	Slight-----------	Severe: wetness.	Severe: wetness.	Poor: wetness.
Ge*:					
Gilbert------------	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Brimstone----------	Severe: wetness, percs slowly, flooding.	Severe: flooding.	Severe: wetness, flooding.	Severe: wetness, flooding.	Poor: wetness.
Gy------------------ Guyton	Severe: wetness, percs slowly.	Severe: flooding.	Severe: wetness.	Severe: wetness.	Poor: wetness.
MA*----------------- Maurepas	Severe: ponding, poor filter.	Severe: seepage, excess humus.	Severe: seepage, ponding.	Severe: seepage, ponding.	Severe: seepage, ponding.
Mt------------------ Myatt	Severe: wetness, percs slowly.	Slight-----------	Severe: wetness.	Severe: wetness.	Poor: wetness.
My------------------ Myatt	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Na------------------ Natalbany	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, wetness, hard to pack.
Oe, Or-------------- Olivier	Severe: wetness, percs slowly.	Slight-----------	Severe: wetness.	Severe: wetness.	Poor: wetness.
OU*:					
Ouachita-----------	Severe: flooding, percs slowly.	Severe: flooding.	Severe: flooding, seepage.	Severe: flooding.	Fair: too clayey.
Ochlockonee--------	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Fair: wetness.
Guyton-------------	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Pa*:					
Pits.					
Arents.					
Sa------------------ Satsuma	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.
Sp------------------ Springfield	Severe: wetness, percs slowly.	Slight-----------	Severe: wetness.	Severe: wetness.	Poor: wetness.
St------------------ Stough	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Ta------------------ Toula	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
Ve------------------ Verdun	Severe: wetness, percs slowly.	Slight-----------	Severe: wetness, excess sodium.	Severe: wetness.	Poor: wetness, excess sodium.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--CONSTRUCTION MATERIALS

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Ab------------------- Abita	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
At*. Aquents				
BA*------------------ Barbary	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Bd------------------- Bude	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Ca------------------- Cahaba	Good.	Probable.	Improbable: too sandy.	Fair: too clayey.
Ch, Cn--------------- Calhoun	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Co------------------- Colyell	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Cy*: Colyell--------------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Springfield----------	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Dv*: Deerford------------	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.
Verdun---------------	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.
Dx------------------- Dexter	Good.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
En------------------- Encrow	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Gb------------------- Gilbert	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Ge*:				
Gilbert	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Brimstone	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Gy Guyton	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
MA* Maurepas	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
Mt, My Myatt	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Na Natalbany	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Oe, Or Olivier	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
OU*:				
Ouachita	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Ochlockonee	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
Guyton	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Pa*:				
Pits.				
Arents.				
Sa Satsuma	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Sp Springfield	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
St Stough	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Ta Toula	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
Ve Verdun	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--WATER MANAGEMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
Ab---------------- Abita	Severe: piping, wetness.	Severe: slow refill.	Percs slowly---	Wetness, percs slowly.	Erodes easily, wetness.	Erodes easily, percs slowly.
At*. Aquents						
BA*--------------- Barbary	Severe: excess humus, hard to pack, ponding.	Severe: slow refill.	Ponding, percs slowly, flooding.	Ponding, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
Bd---------------- Bude	Severe: wetness.	Severe: no water.	Percs slowly---	Wetness, percs slowly.	Erodes easily, wetness, rooting depth.	Wetness, erodes easily, rooting depth.
Ca---------------- Cahaba	Moderate: thin layer, piping.	Severe: no water.	Deep to water	Slope----------	Favorable------	Favorable.
Ch---------------- Calhoun	Severe: piping, wetness.	Severe: no water.	Percs slowly---	Wetness, percs slowly, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily, percs slowly.
Cn---------------- Calhoun	Severe: piping, wetness.	Severe: no water.	Percs slowly, flooding.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily, percs slowly.
Co---------------- Colyell	Moderate: wetness, hard to pack.	Severe: no water.	Percs slowly---	Wetness, percs slowly, erodes easily.	Wetness, percs slowly, erodes easily.	Wetness, erodes easily, percs slowly.
Cy*: Colyell----------	Moderate: wetness, hard to pack.	Severe: no water.	Percs slowly, flooding.	Wetness, percs slowly, erodes easily.	Wetness, percs slowly, erodes easily.	Wetness, erodes easily, percs slowly.
Springfield------	Severe: piping.	Severe: no water.	Percs slowly---	Wetness, percs slowly.	Erodes easily, wetness.	Wetness, erodes easily.
Dv*: Deerford---------	Severe: wetness, excess sodium.	Severe: no water.	Percs slowly, excess sodium.	Wetness, percs slowly, rooting depth.	Erodes easily, wetness, percs slowly.	Wetness, excess sodium, erodes easily.
Verdun-----------	Severe: wetness, excess sodium.	Severe: no water.	Percs slowly, excess sodium.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, excess sodium, erodes easily.
Dx---------------- Dexter	Severe: piping.	Severe: no water.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
En---------------- Encrow	Severe: wetness.	Severe: no water.	Percs slowly, flooding.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
Gb------------------ Gilbert	Severe: wetness.	Severe: no water.	Percs slowly---	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Ge*:						
Gilbert------------	Severe: wetness.	Severe: no water.	Flooding, percs slowly.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Brimstone----------	Severe: wetness.	Severe: no water.	Percs slowly, flooding.	Wetness, percs slowly, flooding.	Erodes easily, wetness.	Wetness, percs slowly, erodes easily.
Gy------------------ Guyton	Severe: piping, wetness.	Severe: no water.	Percs slowly---	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
MA*----------------- Maurepas	Severe: excess humus, ponding.	Slight---------	Ponding, subsides.	Ponding--------	Ponding--------	Wetness.
Mt------------------ Myatt	Severe: piping, wetness.	Severe: slow refill.	Favorable------	Wetness--------	Wetness--------	Wetness.
My------------------ Myatt	Severe: piping, wetness.	Severe: slow refill.	Flooding-------	Wetness, flooding.	Wetness--------	Wetness.
Na------------------ Natalbany	Severe: wetness, hard to pack.	Severe: slow refill.	Percs slowly, flooding.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Oe, Or-------------- Olivier	Severe: piping.	Severe: no water.	Percs slowly---	Wetness, percs slowly, rooting depth.	Erodes easily, wetness, rooting depth.	Wetness, erodes easily, rooting depth.
OU*:						
Ouachita-----------	Severe: piping.	Severe: no water.	Deep to water	Erodes easily, flooding.	Erodes easily	Percs slowly.
Ochlockonee--------	Severe: piping.	Severe: cutbanks cave.	Deep to water	Flooding-------	Favorable------	Favorable.
Guyton-------------	Severe: piping, wetness.	Severe: no water.	Percs slowly, flooding.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Pa*:						
Pits.						
Arents.						
Sa------------------ Satsuma	Moderate: wetness, thin layer, piping.	Severe: no water.	Percs slowly---	Percs slowly, erodes easily, wetness.	Erodes easily, wetness.	Wetness, erodes easily, percs slowly.
Sp------------------ Springfield	Severe: wetness.	Severe: slow refill.	Percs slowly---	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
St----------------- Stough	Moderate: piping, wetness.	Severe: no water.	Favorable------	Wetness, droughty.	Erodes easily, wetness.	Wetness, erodes easily, droughty.
Ta----------------- Toula	Moderate: wetness, piping.	Severe: no water.	Percs slowly---	Wetness, percs slowly.	Erodes easily, wetness, rooting depth.	Erodes easily, percs slowly, rooting depth.
Ve----------------- Verdun	Severe: wetness, excess sodium.	Severe: no water.	Percs slowly, excess sodium.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, excess sodium, erodes easily.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--ENGINEERING INDEX PROPERTIES

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	4	10	40	200		
	In								Pct	
Ab----------------- Abita	0-4	Silt loam--------	ML, CL-ML	A-4	100	100	90-100	70-90	15-30	NP-7
	4-35	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6	100	100	95-100	80-95	20-40	4-20
	35-50	Clay loam, loam, silty clay loam.	CL, CH	A-6, A-7-6	100	100	95-100	80-95	35-55	20-35
	50-60	Clay loam, silty clay loam, loam.	CL	A-6, A-7-6	100	100	95-100	80-95	30-50	15-30
At*. Aquents										
BA*--------------- Barbary	0-6	Muck--------------	PT	A-8	---	---	---	---	---	---
	6-65	Mucky clay, clay	OH, MH	A-7-5, A-8	100	100	100	95-100	70-90	35-45
Bd----------------- Bude	0-18	Silt loam--------	CL	A-6	100	100	95-100	85-96	25-40	11-25
	18-60	Silt loam, silty clay loam, clay loam.	CL	A-6, A-7	100	100	95-100	80-95	35-50	15-30
Ca----------------- Cahaba	0-5	Fine sandy loam	SM	A-4, A-2-4	95-100	95-100	65-90	30-45	---	NP
	5-35	Sandy clay loam, loam, clay loam.	SC, CL	A-4, A-6	90-100	80-100	75-90	40-75	22-35	8-15
	35-60	Sand, loamy sand, sandy loam.	SM, SP-SM	A-2-4	95-100	90-100	60-85	10-35	---	NP
Ch----------------- Calhoun	0-18	Silt loam--------	CL-ML, ML, CL	A-4	100	100	100	95-100	<31	NP-10
	18-30	Silty clay loam, silt loam.	CL	A-6, A-7-6	100	100	95-100	95-100	30-45	11-24
	30-60	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-4	100	100	100	90-100	25-40	5-20
Cn----------------- Calhoun	0-15	Silt loam--------	CL-ML, ML, CL	A-4	100	100	100	95-100	<31	NP-10
	15-60	Silty clay loam, silt loam.	CL	A-6, A-7-6	100	100	95-100	95-100	30-45	11-24
Co----------------- Colyell	0-3	Silt loam--------	ML	A-4	100	100	100	95-100	<31	NP-7
	3-12	Silt loam, silt	CL-ML, CL	A-4	100	100	100	95-100	17-30	4-10
	12-39	Silty clay loam, silty clay, clay.	CL, CH	A-7-6	100	100	100	95-100	45-65	21-36
	39-60	Silty clay loam, silt loam.	CL	A-6, A-7-6	100	100	100	95-100	32-50	11-25
Cy*: Colyell---------	0-4	Silt loam--------	ML	A-4	100	100	100	95-100	<31	NP-7
	4-22	Silt loam, silt	CL-ML, CL	A-4	100	100	100	95-100	17-30	4-10
	22-39	Silty clay loam, silty clay, clay.	CL, CH	A-7-6	100	100	100	95-100	45-65	21-36
	39-60	Silty clay loam, silt loam.	CL	A-6, A-7-6	100	100	100	95-100	32-50	11-25

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	4	10	40	200		
	In								Pct	
Cy*:										
Springfield-----	0-18	Silt loam--------	ML, CL-ML, CL	A-4	100	100	100	95-100	<31	NP-10
	18-50	Silty clay, clay	CH, CL	A-7-6	100	100	100	95-100	45-65	21-36
	50-60	Silt loam, silty clay loam.	CL	A-6, A-7-6	100	100	100	95-100	32-50	11-25
Dv*:										
Deerford--------	0-10	Silt loam--------	ML, CL-ML	A-4	100	100	100	95-100	<28	NP-7
	10-40	Silty clay loam, silt loam.	CL	A-6, A-7-6	100	100	100	95-100	32-49	11-25
	40-60	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-4, A-7-6	100	100	95-100	90-100	25-49	5-25
Verdun----------	0-4	Silt loam--------	ML, CL-ML	A-4	100	100	100	95-100	<27	NP-7
	4-31	Silty clay loam, silt loam.	CL	A-6, A-7-6	95-100	90-100	90-100	80-100	32-45	11-21
	31-70	Silt loam, silty clay loam.	CL	A-6, A-4	95-100	90-100	90-100	80-100	28-40	8-17
Dx--------------- Dexter	0-6	Very fine sandy loam.	ML, SM, CL-ML, SM-SC	A-4	100	100	85-100	45-75	<25	NP-4
	6-46	Silty clay loam, clay loam, silt loam.	CL	A-6, A-4	100	100	90-100	70-90	28-40	8-18
	46-60	Sandy clay loam, fine sandy loam, loamy fine sand.	SC, SM, CL, ML	A-6, A-4, A-2-4	100	100	75-95	25-55	10-30	NP-15
En--------------- Encrow	0-4	Silt loam--------	ML	A-4	100	100	90-100	90-100	<31	NP-7
	4-27	Silt loam, silty clay loam.	CL	A-4, A-6	100	100	90-100	90-100	28-40	8-17
	27-48	Silty clay loam, silty clay, clay.	CL	A-7-6	100	100	90-100	90-100	45-65	21-36
	48-60	Silty clay loam, silt loam.	CL	A-6, A-7-6	100	100	90-100	90-100	32-50	11-25
Gb--------------- Gilbert	0-12	Silt loam--------	ML, CL-ML, CL	A-4	100	100	95-100	90-100	23-31	3-10
	12-43	Silty clay loam, silt loam.	CL	A-6, A-7-6	100	100	95-100	90-100	32-45	11-22
	43-60	Silty clay loam, silt loam, loam.	CL, CL-ML	A-6, A-7, A-4	100	100	90-100	90-100	25-45	5-22
Ge*:										
Gilbert---------	0-12	Silt loam--------	ML, CL-ML, CL	A-4	100	100	95-100	90-100	23-31	3-10
	12-42	Silty clay loam, silt loam.	CL	A-6, A-7-6	100	100	95-100	90-100	32-45	11-22
	42-60	Silty clay loam, silt loam, loam.	CL, CL-ML	A-6, A-7, A-4	100	100	90-100	90-100	25-45	5-22
Brimstone-------	0-24	Silt loam--------	CL-ML, CL	A-4, A-6	100	100	90-100	70-90	15-38	6-17
	24-30	Silt loam, silty clay loam.	CL	A-6, A-7-6	100	100	95-100	80-95	26-48	11-33
	30-60	Silty clay loam, silt loam.	CL	A-6, A-7-6	100	100	95-100	80-95	26-48	11-33

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	4	10	40	200		
	In								Pct	
Gy--------------- Guyton	0-24	Silt loam--------	ML, CL-ML	A-4	100	100	95-100	65-90	<27	NP-7
	24-44	Silt loam, silty clay loam, clay loam.	CL, CL-ML	A-6, A-4	100	100	94-100	75-95	22-40	6-18
	44-60	Silt loam, silty clay loam, clay loam.	CL, CL-ML, ML	A-6, A-4	100	100	95-100	70-95	<40	NP-18
MA*-------------- Maurepas	0-84	Muck-------------	PT	A-8	---	---	---	---	---	---
Mt--------------- Myatt	0-10	Fine sandy loam	SM, SM-SC, ML, CL-ML	A-2, A-4	95-100	95-100	60-90	30-70	<25	NP-5
	10-60	Loam, sandy clay loam, clay loam.	SM, SC, ML, CL	A-4	95-100	95-100	80-100	40-80	<30	NP-10
My--------------- Myatt	0-12	Fine sandy loam	SM, SM-SC, ML, CL-ML	A-2, A-4	95-100	95-100	60-90	30-70	<25	NP-5
	12-60	Loam, sandy clay loam, clay loam.	SM, SC, ML, CL	A-4	95-100	95-100	80-100	40-80	<30	NP-10
Na--------------- Natalbany	0-5	Silty clay loam	CL, CH	A-7-6, A-6	100	100	95-100	95-100	30-58	12-30
	5-42	Silty clay, clay	CH	A-7-6	100	100	95-100	95-100	51-63	30-41
	42-80	Silty clay, clay	CH	A-7-6	100	100	95-100	95-100	51-63	30-41
Oe--------------- Olivier	0-8	Silt loam--------	ML, CL-ML	A-4	100	100	100	95-100	<27	NP-7
	8-23	Silty clay loam, silt loam.	CL	A-6	100	100	100	95-100	32-40	11-17
	23-63	Silt loam--------	CL-ML, CL	A-4, A-6	100	100	100	95-100	25-35	5-14
Or--------------- Olivier	0-4	Silt loam--------	ML, CL-ML	A-4	100	100	100	95-100	<27	NP-7
	4-30	Silty clay loam, silt loam.	CL	A-6	100	100	100	95-100	32-40	11-17
	30-60	Silt loam--------	CL-ML, CL	A-4, A-6	100	100	100	95-100	25-35	5-14
OU*: Ouachita---------	0-5	Silt loam--------	ML, CL, CL-ML	A-4, A-6	100	100	85-100	75-95	<30	NP-12
	5-60	Silt loam, loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6	100	100	85-100	80-100	25-40	5-20
Ochlockonee------	0-5	Sandy loam-------	SM, ML, SM-SC, CL-ML	A-4, A-2	100	95-100	65-90	40-70	<26	NP-5
	5-60	Loamy sand, sandy loam, silt loam.	SM, ML, CL, SC	A-4, A-2	100	95-100	85-99	13-80	<32	NP-9
Guyton-----------	0-24	Silt loam--------	ML, CL-ML	A-4	100	100	95-100	65-90	<27	NP-7
	24-44	Silt loam, silty clay loam, clay loam.	CL, CL-ML	A-6, A-4	100	100	94-100	75-95	22-40	6-18
	44-66	Silt loam, silty clay loam, clay loam.	CL, CL-ML, ML	A-6, A-4	100	100	95-100	70-95	<40	NP-18
Pa*: Pits.										
Arents.										

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	4	10	40	200		
	In								Pct	
Sa---------------- Satsuma	0-4	Silt loam--------	ML	A-4	100	100	95-100	80-95	<30	NP-7
	4-12	Silt loam--------	CL-ML, CL	A-4, A-6	100	100	95-100	80-95	17-30	6-19
	12-28	Silty clay loam, silty clay.	CL, CH	A-6, A-7-6	100	100	95-100	80-95	35-55	20-35
	28-65	Silty clay loam, clay loam, loam.	CL	A-6	100	100	80-90	70-80	20-40	10-20
Sp---------------- Springfield	0-13	Silt loam--------	ML, CL-ML, CL	A-4	100	100	100	95-100	<31	NP-10
	13-20	Silty clay, clay	CH, CL	A-7-6	100	100	100	95-100	45-65	21-36
	20-60	Silty clay loam, silt loam.	CL	A-6, A-7-6	100	100	100	95-100	32-50	11-25
St---------------- Stough	0-7	Fine sandy loam	SM-SC, SM, ML, CL-ML	A-4	100	100	65-85	35-65	<25	NP-7
	7-14	Loam, fine sandy loam, sandy loam.	ML, CL, CL-ML	A-4	100	100	75-95	50-75	<25	NP-8
	14-60	Sandy loam, sandy clay loam, loam.	SC, CL	A-4, A-6	100	100	65-90	40-65	25-40	8-15
Ta---------------- Toula	0-6	Silt loam--------	ML, CL-ML	A-4	100	100	95-100	80-95	<30	NP-7
	6-31	Silt loam, silty clay loam.	CL	A-4, A-6	100	100	95-100	80-95	20-35	8-18
	31-65	Silt loam, silty clay loam, loam.	CL	A-6	100	100	85-100	75-95	25-40	11-20
Ve---------------- Verdun	0-12	Silt loam--------	ML, CL-ML	A-4	100	100	100	95-100	<27	NP-7
	12-45	Silty clay loam, silt loam.	CL	A-6, A-7-6	95-100	90-100	90-100	80-100	32-45	11-21
	45-60	Silt loam, silty clay loam.	CL	A-6, A-4	95-100	90-100	90-100	80-100	28-40	8-17

* See description of the map unit for composition and behavior characteristics of the map unit.

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

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
Ab---------------- Abita	0-4	2-12	1.35-1.65	0.6-2.0	0.16-0.23	3.6-7.3	Low-----------	0.49	5	.5-4
	4-35	12-32	1.35-1.65	0.2-0.6	0.19-0.21	3.6-7.3	Low-----------	0.43		
	35-50	20-45	1.35-1.70	0.06-0.2	0.15-0.18	4.5-6.5	Moderate-----	0.37		
	50-60	20-40	1.35-1.70	0.06-0.2	0.15-0.18	5.1-7.8	Moderate-----	0.37		
At*. Aquents										
BA*--------------- Barbary	0-6	45-90	0.15-0.50	2.0-6.0	0.20-0.50	5.6-7.8	Low-----------	----	---	30-70
	6-65	60-95	0.25-1.00	<0.06	0.18-0.20	6.6-8.4	Low-----------	0.32		
Bd---------------- Bude	0-18	10-27	1.40-1.60	0.6-2.0	0.21-0.24	4.5-6.0	Low-----------	0.49	3	.5-4
	18-60	10-32	1.40-1.80	0.06-0.2	0.14-0.23	4.5-6.0	Moderate-----	0.43		
Ca---------------- Cahaba	0-5	7-17	1.35-1.60	2.0-6.0	0.10-0.14	4.5-6.0	Low-----------	0.24	5	.5-2
	5-35	18-35	1.35-1.60	0.6-2.0	0.12-0.20	4.5-6.0	Low-----------	0.28		
	35-60	4-20	1.40-1.70	2.0-20	0.05-0.10	4.5-6.0	Low-----------	0.24		
Ch---------------- Calhoun	0-18	10-27	1.30-1.65	0.2-0.6	0.21-0.23	3.6-6.0	Low-----------	0.49	5	.5-4
	18-30	22-35	1.30-1.70	0.06-0.2	0.20-0.22	4.5-5.5	Moderate-----	0.43		
	30-60	10-30	1.40-1.70	0.2-0.6	0.21-0.23	4.5-7.8	Low-----------	0.43		
Cn---------------- Calhoun	0-15	10-27	1.30-1.65	0.2-0.6	0.21-0.23	3.6-6.0	Low-----------	0.49	5	.5-4
	15-60	22-35	1.30-1.65	0.06-0.2	0.20-0.22	4.5-7.8	Moderate-----	0.43		
Co---------------- Colyell	0-3	2-12	1.20-1.65	0.6-2.0	0.14-0.24	4.5-6.0	Low-----------	0.49	5	.5-4
	3-12	6-19	1.20-1.65	0.6-2.0	0.20-0.24	4.5-6.0	Low-----------	0.49		
	12-39	35-60	1.30-1.55	0.06-0.2	0.08-0.19	4.5-7.3	High----------	0.32		
	39-60	20-38	1.35-1.70	0.06-0.6	0.20-0.22	5.1-8.4	Moderate-----	0.32		
Cy*: Colyell----------	0-4	2-12	1.20-1.65	0.6-2.0	0.14-0.24	4.5-6.0	Low-----------	0.49	5	.5-4
	4-22	6-18	1.20-1.65	0.6-2.0	0.20-0.24	4.5-6.0	Low-----------	0.49		
	22-39	35-60	1.30-1.55	0.06-0.2	0.08-0.19	4.5-7.3	High----------	0.32		
	39-60	20-38	1.35-1.70	0.06-0.6	0.20-0.22	5.1-8.4	Moderate-----	0.32		
Springfield------	0-18	5-25	1.35-1.65	0.6-2.0	0.21-0.23	4.5-6.5	Low-----------	0.49	5	.5-2
	18-50	40-60	1.20-1.50	0.06-0.2	0.08-0.19	4.5-5.5	High----------	0.32		
	50-60	20-38	1.30-1.60	0.06-0.2	0.14-0.23	5.1-8.4	Moderate-----	0.32		
Dv*: Deerford---------	0-10	5-27	1.30-1.70	0.6-2.0	0.21-0.23	4.5-6.5	Low-----------	0.49	3	.5-4
	10-40	10-35	1.30-1.80	0.06-0.2	0.12-0.18	4.5-8.4	Moderate-----	0.49		
	40-60	10-35	1.30-1.80	0.2-0.6	0.12-0.18	6.6-8.4	Moderate-----	0.49		
Verdun-----------	0-4	5-20	1.35-1.65	0.2-0.6	0.21-0.24	5.1-7.8	Low-----------	0.49	3	.5-2
	4-31	18-35	1.35-1.65	<0.06	0.11-0.20	5.6-8.4	Moderate-----	0.49		
	31-70	15-35	1.35-1.65	0.06-0.2	0.10-0.20	7.9-9.0	Low-----------	0.49		
Dx---------------- Dexter	0-6	10-27	1.30-1.70	0.6-2.0	0.15-0.24	4.5-6.5	Low-----------	0.43	5	.5-4
	6-46	10-35	1.40-1.70	0.6-2.0	0.15-0.24	4.5-6.0	Low-----------	0.32		
	46-60	10-30	1.30-1.70	0.6-6.0	0.08-0.18	4.5-6.0	Low-----------	0.24		

See footnote at end of table.

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

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH				Pct
En----------------- Encrow	0-4	2-15	1.35-1.65	0.6-2.0	0.14-0.24	3.6-6.5	Low-----------	0.49	5	.5-4
	4-27	6-38	1.35-1.65	0.6-2.0	0.14-0.24	3.6-6.5	Low-----------	0.49		
	27-48	27-60	1.20-1.55	0.06-0.2	0.02-0.19	3.6-6.5	High----------	0.32		
	48-60	20-38	1.30-1.70	0.06-0.6	0.18-0.24	3.6-6.5	Moderate------	0.32		
Gb----------------- Gilbert	0-12	8-25	1.35-1.65	0.6-2.0	0.22-0.24	4.5-6.0	Low-----------	0.43	4	.5-4
	12-43	18-35	1.40-1.60	<0.06	0.14-0.23	4.5-6.0	Moderate------	0.43		
	43-60	18-35	1.40-1.65	<0.06	0.14-0.23	6.6-9.0	Moderate------	0.43		
Ge*:										
Gilbert-----------	0-12	8-25	1.35-1.65	0.6-2.0	0.22-0.24	4.5-6.0	Low-----------	0.43	4	.5-4
	12-42	18-35	1.40-1.60	<0.06	0.14-0.23	4.5-6.0	Moderate------	0.43		
	42-60	18-35	1.40-1.65	<0.06	0.14-0.23	6.6-9.0	Moderate------	0.43		
Brimstone---------	0-24	5-14	1.35-1.65	0.6-2.0	0.13-0.20	4.5-7.8	Low-----------	0.49	3	.5-2
	24-30	17-32	1.35-1.70	0.06-0.2	0.10-0.16	4.5-8.4	Moderate------	0.43		
	30-60	20-35	1.35-1.70	0.06-0.2	0.10-0.16	5.1-8.4	Moderate------	0.43		
Gy----------------- Guyton	0-24	7-25	1.35-1.65	0.6-2.0	0.20-0.23	3.6-6.0	Low-----------	0.43	5	.5-4
	24-44	20-35	1.35-1.70	0.06-0.2	0.15-0.22	3.6-6.5	Low-----------	0.37		
	44-60	20-35	1.35-1.70	0.06-2.0	0.15-0.22	3.6-8.4	Low-----------	0.37		
MA*---------------- Maurepas	0-84	---	0.05-0.25	>2.0	0.20-0.50	5.6-8.4	Low-----------	----	---	---
Mt----------------- Myatt	0-10	7-20	1.30-1.60	0.6-2.0	0.11-0.20	4.5-6.0	Low-----------	0.28	5	.5-4
	10-60	18-35	1.30-1.50	0.2-0.6	0.12-0.20	3.6-5.5	Low-----------	0.28		
My----------------- Myatt	0-12	7-20	1.30-1.60	0.6-2.0	0.11-0.20	4.5-6.0	Low-----------	0.28	5	.5-4
	12-60	18-35	1.30-1.50	0.2-0.6	0.12-0.20	3.6-5.5	Low-----------	0.28		
Na----------------- Natalbany	0-5	27-39	1.20-1.65	0.06-0.2	0.18-0.22	3.6-6.0	Moderate------	0.37	5	.5-4
	5-42	40-55	1.10-1.65	<0.06	0.12-0.21	3.6-6.5	High----------	0.32		
	42-80	40-55	1.10-1.65	<0.06	0.12-0.21	4.5-8.4	High----------	0.32		
Oe----------------- Olivier	0-8	8-18	1.35-1.65	0.6-2.0	0.21-0.23	4.5-6.5	Low-----------	0.49	3	.5-4
	8-23	18-35	1.35-1.65	0.2-0.6	0.20-0.22	4.5-5.5	Moderate------	0.43		
	23-63	14-27	1.40-1.80	0.06-0.2	0.11-0.15	4.5-7.3	Low-----------	0.43		
Or----------------- Olivier	0-4	8-18	1.35-1.65	0.6-2.0	0.21-0.23	4.5-6.5	Low-----------	0.49	3	.5-4
	4-30	18-35	1.35-1.65	0.2-0.6	0.20-0.22	4.5-5.5	Moderate------	0.43		
	30-60	14-27	1.40-1.80	0.06-0.2	0.11-0.15	4.5-7.3	Low-----------	0.43		
OU*:										
Ouachita----------	0-5	8-25	1.25-1.60	0.6-2.0	0.15-0.24	4.5-6.0	Low-----------	0.37	5	1-2
	5-60	18-35	1.25-1.60	0.2-0.6	0.15-0.24	3.6-5.5	Low-----------	0.32		
Ochlockonee-------	0-5	3-18	1.40-1.60	2.0-6.0	0.07-0.14	4.5-6.0	Low-----------	0.20	5	.5-2
	5-60	3-18	1.40-1.70	2.0-6.0	0.06-0.12	4.5-5.5	Low-----------	0.17		
Guyton------------	0-24	7-25	1.35-1.65	0.6-2.0	0.20-0.23	3.6-6.0	Low-----------	0.43	5	.5-4
	24-44	20-35	1.35-1.70	0.06-0.2	0.15-0.22	3.6-6.5	Low-----------	0.37		
	44-66	20-35	1.35-1.70	0.06-2.0	0.15-0.22	3.6-8.4	Low-----------	0.37		
Pa*:										
Pits.										
Arents.										

See footnote at end of table.

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

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
Sa----------------- Satsuma	0-4	2-12	1.35-1.65	0.6-2.0	0.14-0.24	4.5-6.0	Low-----------	0.49	5	.5-4
	4-12	6-18	1.35-1.65	0.6-2.0	0.20-0.24	4.5-6.0	Low-----------	0.49		
	12-28	27-45	1.35-1.65	0.06-0.2	0.15-0.18	4.5-6.0	Moderate-----	0.37		
	28-65	18-33	1.35-1.65	0.6-2.0	0.20-0.24	4.5-7.3	Low-----------	0.37		
Sp----------------- Springfield	0-13	5-25	1.35-1.65	0.6-2.0	0.21-0.24	4.5-6.0	Low-----------	0.43	5	.5-2
	13-20	40-60	1.20-1.50	0.06-0.2	0.08-0.19	4.5-6.0	High----------	0.32		
	20-60	20-38	1.30-1.60	0.06-0.6	0.14-0.23	5.1-8.4	Moderate-----	0.32		
St----------------- Stough	0-7	5-15	1.40-1.55	0.6-2.0	0.12-0.18	4.5-5.5	Low-----------	0.28	3	1-4
	7-14	8-18	1.45-1.60	0.2-0.6	0.07-0.11	4.5-5.5	Low-----------	0.37		
	14-60	5-27	1.55-1.65	0.2-0.6	0.07-0.11	4.5-5.5	Low-----------	0.37		
Ta----------------- Toula	0-6	2-12	1.35-1.65	0.6-2.0	0.22-0.25	4.5-6.0	Low-----------	0.49	3	.5-4
	6-31	12-30	1.35-1.65	0.6-2.0	0.14-0.24	4.5-6.0	Low-----------	0.43		
	31-65	17-35	1.45-1.85	0.06-0.2	0.08-0.14	4.5-6.0	Low-----------	0.37		
Ve----------------- Verdun	0-12	5-20	1.35-1.65	0.2-0.6	0.21-0.24	3.6-7.8	Low-----------	0.49	3	.5-2
	12-45	18-35	1.35-1.65	<0.06	0.11-0.20	5.6-8.4	Moderate-----	0.49		
	45-60	15-35	1.35-1.65	0.06-0.2	0.10-0.20	6.6-9.0	Low-----------	0.49		

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--SOIL AND WATER FEATURES

("Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydrologic group	Flooding			High water table			Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Initial	Total	Uncoated steel	Concrete
					Ft			In	In		
Ab: Abita	C	None	---	---	1.5-3.0	Apparent	Dec-Apr	---	---	High	Moderate.
At*. Aquents											
BA*: Barbary	D	None	---	---	+1-0.5	Apparent	Jan-Dec	3-12	6-15	High	Moderate.
Bd: Bude	C	None	---	---	0.5-1.5	Perched	Jan-Apr	---	---	High	High.
Ca: Cahaba	B	None	---	---	>6.0	---	---	---	---	Moderate	Moderate.
Ch: Calhoun	D	Rare	---	---	0-1.5	Perched	Dec-Apr	---	---	High	Moderate.
Cn: Calhoun	D	Occasional	Brief to long.	Dec-Jun	0-1.5	Perched	Dec-Apr	---	---	High	Moderate.
Co: Colyell	C	Rare	---	---	1.5-3.0	Perched	Dec-Apr	---	---	High	Moderate.
Cy*: Colyell	C	Frequent	Brief	Jan-Dec	1.5-3.0	Perched	Dec-Apr	---	---	High	Moderate.
Springfield	C	Frequent	Brief	Jan-Dec	0.5-2.0	Perched	Dec-Apr	---	---	High	Moderate.
Dv*: Deerford	D	Rare	---	---	0.5-1.5	Perched	Dec-Apr	---	---	High	Moderate.
Verdun	D	Rare	---	---	0.5-1.0	Perched	Dec-Apr	---	---	High	Low.
Dx: Dexter	B	None	---	---	>6.0	---	---	---	---	Moderate	Moderate.
En: Encrow	D	Occasional	Brief to long.	Dec-Apr	0-1.5	Perched	Dec-Apr	---	---	High	Moderate.
Gb: Gilbert	D	Rare	---	---	0-1.5	Perched	Dec-Apr	---	---	High	Moderate.
Ge*: Gilbert	D	Occasional	Brief to long.	Dec-May	0-1.5	Perched	Dec-Apr	---	---	High	Moderate.
Brimstone	D	Occasional	Brief to long.	Dec-Jun	0-1.5	Perched	Dec-Apr	---	---	High	Low.
Gy: Guyton	D	Rare	---	---	0-1.5	Perched	Dec-May	---	---	High	High.

See footnote at end of table.

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

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Initial	Total	Uncoated steel	Concrete
					Ft			In	In		
MA*: Maurepas	D	None	---	---	+1-0.5	Apparent	Jan-Dec	15-30	>51	High	Moderate.
Mt: Myatt	D	Rare	---	---	0-1.0	Apparent	Nov-Apr	---	---	High	High.
My: Myatt	D	Occasional	Brief	Jan-Dec	0-1.0	Apparent	Nov-Apr	---	---	High	High.
Na: Natalbany	D	Frequent	Long	Jan-Dec	0-1.0	Apparent	Dec-Apr	---	---	High	Moderate.
Oe, Or: Olivier	C	None	---	---	1.0-2.5	Perched	Dec-Apr	---	---	High	Moderate.
OU*:											
Ouachita	C	Frequent	Very brief to long.	Jan-Dec	>6.0	---	---	---	---	Moderate	Moderate.
Ochlockonee	B	Frequent	Very brief to long.	Jan-Dec	3.0-5.0	Apparent	Dec-Apr	---	---	Low	High.
Guyton	D	Frequent	Very brief to long.	Jan-Dec	0-1.5	Perched	Dec-May	---	---	High	High.
Pa*:											
Pits.											
Arents.											
Sa: Satsuma	C	Rare	---	---	1.5-3.0	Perched	Dec-Apr	---	---	High	Moderate.
Sp: Springfield	D	None	---	---	0.5-2.0	Apparent	Dec-Apr	---	---	High	Moderate.
St: Stough	C	Rare	---	---	1.0-1.5	Perched	Jan-Apr	---	---	Moderate	High.
Ta: Toula	C	None	---	---	1.5-3.0	Perched	Dec-Apr	---	---	Moderate	Moderate.
Ve: Verdun	D	Rare	---	---	0.5-1.0	Perched	Dec-Apr	---	---	High	Low.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--FERTILITY TEST DATA FOR SELECTED SOILS

(The symbol < means less than. Dashes indicate analyses not made. Analyses by the Soil Fertility Laboratory, Louisiana Agricultural Experiment Station)

Soil name and sample number	Depth	Horizon	pH 1:1 H_2O	Organic matter content	Extractable phosphorus	Exchangeable cations: Ca	Mg	K	Na	Al	H	Total acidity	Effective cation-exchange capacity	Cation-exchange capacity (sum)	Base saturation (sum)	Saturation: Sum of cation-exchange capacity Na	Saturation: Effective cation-exchange capacity Al
	In			Pct	Ppm	Milliequivalents/100 grams of soil									Pct	Pct	Pct
Brimstone silt loam:[1] (S86LA-63-35)	0-4	A	4.5	1.52	5	1.0	0.5	0.0	0.0	2.3	0.5	7.5	4.3	9.0	16.7	0.0	53.5
	4-18	Eg	4.5	0.54	5	0.9	0.5	0.0	0.1	2.2	0.6	4.8	4.3	6.3	23.8	1.6	51.2
	18-24	E/Bg	4.9	0.37	5	2.0	1.2	0.0	0.5	2.5	0.3	4.8	6.5	8.5	43.5	5.9	38.5
	24-30	B/Eg	5.1	0.28	5	3.3	2.2	0.1	1.3	2.2	0.4	6.0	9.5	12.9	53.5	10.1	23.2
	30-48	Btng1	5.1	0.10	5	5.6	4.1	0.1	2.8	0.9	0.5	6.0	14.0	18.6	67.7	15.1	6.4
	48-60	Btng2	5.6	0.01	9	6.3	4.6	0.1	4.4	0.2	0.2	5.4	15.4	20.4	73.5	19.6	1.3
Bude silt loam:[2] (S86LA-63-25)	0-3	A	4.5	3.24	<5	1.1	0.5	0.1	0.0	2.3	0.3	10.3	4.3	12.0	14.2	0.0	53.5
	3-14	Bw	4.5	0.46	<5	0.8	0.5	0.0	0.0	2.8	0.2	9.0	4.3	10.3	12.6	0.0	65.1
	14-24	B/E	4.8	0.19	<5	1.1	1.5	0.1	0.2	8.3	0.0	15.8	11.2	18.7	15.5	1.1	74.1
	24-28	Bx1	5.1	0.15	<5	2.9	3.2	0.2	0.5	7.5	0.0	15.0	14.3	21.8	31.2	2.3	52.4
	28-38	Bx2	5.1	0.15	<5	3.5	4.0	0.2	0.6	5.3	0.3	12.3	13.9	20.6	40.3	2.9	38.1
	38-60	Bx3	5.2	0.19	<5	4.7	4.9	0.2	0.7	2.4	0.4	9.2	13.3	19.7	53.3	3.6	18.0
Cahaba fine sandy loam:[1] (S86LA-63-19)	0-5	A	5.3	1.78	24	1.0	0.4	0.2	0.0	0.3	0.2	4.6	2.1	6.2	25.8	0.0	14.3
	5-14	Bt1	4.7	0.46	<5	1.4	0.4	0.1	0.0	2.4	0.2	6.5	4.5	8.4	22.6	0.0	53.3
	14-35	Bt2	4.7	0.15	<5	1.3	1.0	0.1	0.0	3.2	0.2	7.4	5.8	9.8	24.5	0.0	55.2
	35-53	BC	4.7	0.10	7	0.4	0.8	0.0	0.0	1.8	0.4	4.6	3.4	5.8	20.7	0.0	52.9
	53-60	C	4.6	0.04	9	0.4	0.5	0.0	0.0	1.1	0.2	2.7	2.2	3.6	25.0	0.0	50.0
Calhoun silt loam:[1] (S86LA-63-24)	0-3	A	4.3	2.22	<5	2.9	0.8	0.1	0.1	1.8	0.2	8.4	5.9	12.3	31.7	0.8	30.5
	3-12	Eg1	4.5	0.99	<5	2.2	0.8	0.2	0.1	2.1	0.3	5.7	5.7	9.0	36.7	1.1	36.8
	12-18	Eg2	4.4	0.77	<5	2.3	1.2	0.1	0.1	4.1	0.1	8.4	7.9	12.1	30.6	0.8	51.9
	18-30	E/Bg	4.5	1.34	<5	2.6	1.9	0.1	0.4	3.2	0.4	8.0	8.6	13.0	38.5	3.1	37.2
	30-36	B/Eg	4.4	0.28	<5	3.9	4.5	0.1	1.5	2.3	0.3	8.4	12.6	18.4	54.3	8.2	18.3
	36-48	Btg	5.0	0.10	<5	4.8	5.4	0.1	2.4	0.2	0.4	5.7	13.3	18.4	69.0	13.0	1.5
	48-60	BCg	5.9	0.15	<5	5.4	5.4	0.1	2.4	0.0	0.2	4.4	13.5	17.7	75.1	13.6	0.0

See footnotes at end of table.

TABLE 18.--FERTILITY TEST DATA FOR SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	pH 1:1 H_2O	Organic matter content	Extractable phosphorus	Exchangeable cations: Ca	Mg	K	Na	Al	H	Total acidity	Effective cation-exchange capacity	Cation-exchange capacity (sum)	Base saturation (sum)	Saturation: Sum of cation-exchange capacity Na	Saturation: Effective cation-exchange capacity Al
	In			Pct	Ppm	-------Milliequivalents/100 grams of soil---------									Pct	Pct	Pct
Calhoun silt loam:[3]	0-4	A	4.9	2.84	22	3.2	1.4	0.1	0.1	0.4	0.4	6.3	5.6	11.1	43.2	0.9	7.1
(S86LA-63-30)	4-14	Eg	5.1	0.85	22	2.4	1.1	0.0	0.1	0.5	0.7	4.2	4.8	7.8	46.2	1.3	10.4
	14-24	E/Bg	5.2	0.46	23	2.9	1.2	0.0	0.1	0.5	0.5	3.3	5.2	7.5	56.0	1.3	9.6
	24-35	B/Eg	5.3	0.15	80	8.2	4.1	0.1	0.8	0.2	0.4	4.2	13.8	17.4	75.9	4.6	1.4
	35-50	Btg1	6.6	0.01	100	14.0	7.8	0.2	2.4	---	---	4.2	---	28.6	85.3	8.4	---
	50-60	Btg2	6.8	0.01	150	13.4	7.2	0.2	2.6	---	---	3.3	---	26.7	87.6	9.7	---
Colyell silt loam:[4]	0-6	A	4.8	1.47	<5	2.6	1.1	0.1	0.0	1.3	0.2	9.3	5.3	13.1	29.0	0.0	24.5
(S86LA-63-18)	6-12	E	4.6	0.32	<5	1.7	0.7	0.0	0.0	1.0	0.4	6.6	3.8	9.0	26.7	0.0	26.3
	12-16	Bw	4.6	0.24	<5	1.8	0.9	0.0	0.1	1.9	0.3	8.0	5.0	10.8	25.9	0.9	38.0
	16-27	Bt	4.5	0.28	<5	2.0	2.1	0.1	0.2	2.8	0.2	11.2	7.4	15.6	28.2	1.3	37.8
	27-37	2B/Eg	4.7	0.37	<5	1.9	2.9	0.2	0.3	6.6	0.0	16.9	11.9	22.2	23.9	1.4	55.5
	37-54	2Btg1	4.7	0.24	6	2.5	3.3	0.1	0.4	6.6	0.1	11.6	13.0	17.9	35.2	2.2	50.8
	54-60	2Btg2	5.1	0.15	<5	5.8	7.2	0.2	1.0	2.6	0.4	8.0	17.2	22.2	64.0	4.5	15.1
Colyell silt loam:[5]	0-4	A	5.1	3.55	7	3.5	1.2	0.2	0.1	0.2	0.3	9.9	5.5	14.9	33.6	0.7	3.6
(S86LA-63-22)	4-10	Bw	4.6	0.37	<5	2.0	0.7	0.1	0.1	3.2	0.0	8.0	6.1	10.9	26.6	0.9	52.5
	10-14	Bt	4.6	0.41	<5	2.0	0.9	0.1	0.1	4.4	0.0	8.1	7.5	11.2	27.7	0.9	58.7
	14-20	B/E	5.0	0.24	<5	3.1	3.5	0.2	0.8	9.0	0.1	16.0	16.7	23.6	32.2	3.4	53.9
	20-27	2Bt	5.0	0.24	<5	3.7	4.4	0.4	1.0	8.8	0.4	16.0	18.7	25.5	37.3	3.9	47.1
	27-46	2BCn	5.4	0.15	<5	5.6	7.0	0.2	1.5	0.7	0.6	6.5	15.6	20.8	68.8	7.2	4.5
	46-60	3BCn	6.6	0.10	<5	6.6	7.1	0.2	1.9	0.0	0.2	3.4	16.0	19.2	82.3	9.9	0.0
Deerford silt loam:[1]	0-4	A	4.9	1.61	<5	1.8	0.7	0.0	0.1	0.5	0.4	2.3	3.5	4.9	53.1	2.0	14.3
(S86LA-63-21)	4-10	E	5.2	0.41	<5	1.6	0.9	0.0	0.2	1.9	0.2	5.1	4.8	7.8	34.6	2.6	39.6
	10-19	B/E1	4.9	0.32	<5	2.9	3.9	0.2	1.4	6.8	0.5	12.9	15.7	21.3	39.4	6.6	43.3
	19-27	B/E2	5.0	0.41	<5	4.7	6.0	0.2	2.5	5.2	0.1	11.4	18.7	24.8	54.0	10.1	27.8
	27-34	Bn/E	5.8	0.24	<5	5.9	6.7	0.2	3.7	0.1	0.4	5.7	17.0	22.2	74.3	16.7	0.6
	34-40	Btn	7.5	0.10	<5	5.7	5.3	0.2	3.6	0.0	0.2	2.7	15.0	17.5	84.6	20.6	0.0
	40-60	BCn	8.4	0.06	41	8.2	4.6	0.2	4.2	0.0	0.2	1.5	17.4	18.7	92.0	22.5	0.0
Dexter very fine sandy loam:[1]	0-6	Ap	4.9	0.72	27	1.5	0.5	0.2	0.0	0.4	0.2	5.3	2.8	7.5	29.3	0.0	14.3
(S86LA-63-23)	6-18	Bt1	4.8	0.59	6	2.4	0.9	0.2	0.0	1.2	0.4	6.8	5.1	10.3	34.0	0.0	23.5
	18-34	Bt2	5.1	0.24	11	3.7	3.0	0.2	0.1	0.5	0.3	7.6	7.8	14.6	47.9	0.7	6.4
	34-46	2BC	5.1	0.19	9	2.4	3.1	0.2	0.0	0.5	0.5	5.9	6.7	11.6	49.1	0.0	7.5
	46-60	2C	5.0	0.19	14	1.8	2.5	0.3	0.0	0.5	0.4	4.9	5.5	9.5	48.4	0.0	9.1

See footnotes at end of table.

TABLE 18.--FERTILITY TEST DATA FOR SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	pH 1:1 H_2O	Organic matter content	Extractable phosphorus	Exchangeable cations: Ca	Mg	K	Na	Al	H	Total acidity	Effective cation-exchange capacity	Cation-exchange capacity (sum)	Base saturation (sum)	Saturation: Sum of cation-exchange capacity Na	Saturation: Effective cation-exchange capacity Al
	In			Pct	Ppm	Milliequivalents/100 grams of soil									Pct	Pct	Pct
Encrow silt loam:[6] (S86LA-63-33)	0-4	A	4.7	2.31	21	3.7	1.2	0.1	0.1	2.3	0.5	10.2	7.9	15.3	33.3	0.7	29.1
	4-12	Eg	4.6	0.90	18	2.4	0.8	0.0	0.1	3.4	0.6	7.2	7.3	10.5	31.4	1.0	46.6
	12-27	E/Bg	4.8	0.94	29	3.8	1.2	0.0	0.1	3.8	0.6	8.4	9.5	13.5	37.8	0.7	40.0
	27-36	2Btg1	4.8	0.50	66	6.5	2.2	0.1	0.3	7.6	0.4	13.2	17.1	22.3	40.8	1.3	44.4
	36-42	2Btg2	4.9	0.10	95	8.7	2.9	0.2	0.4	7.2	0.4	12.0	19.8	24.2	50.4	1.7	36.4
	42-48	2Btg3	5.1	0.10	119	10.1	3.3	0.2	0.5	4.9	0.1	10.8	19.1	24.9	56.6	2.0	25.7
	48-60	2BCng	5.1	0.06	143	11.6	3.7	0.2	0.6	0.9	0.3	7.5	19.3	23.6	68.2	2.5	15.0
Gilbert silt loam:[1] (S86LA-63-14)	0-4	A	5.1	2.62	8	2.5	0.5	0.1	0.1	0.2	0.2	6.9	3.6	10.1	31.7	1.0	5.6
	4-7	Eg1	5.3	0.46	<5	1.2	0.3	0.1	0.1	0.4	0.2	2.3	2.3	4.0	42.5	2.5	17.4
	7-12	Eg2	5.2	0.61	<5	2.8	1.2	0.1	0.5	1.5	0.3	5.3	6.4	9.9	46.5	5.1	23.4
	12-28	B/Eg	5.0	0.59	<5	4.1	3.4	0.1	1.3	4.8	0.1	11.4	13.8	20.3	43.8	6.4	34.8
	28-43	Btng1	4.9	0.50	<5	4.9	6.6	0.2	3.3	3.5	0.4	11.2	18.9	26.2	57.3	12.6	18.5
	43-60	Btng2	7.6	0.10	<5	6.1	7.6	0.2	4.2	0.0	0.2	3.4	18.3	21.5	84.2	19.5	0.0
Guyton silt loam:[7] (S86LA-63-16)	0-4	A	5.0	3.15	<5	2.9	0.9	0.1	0.1	0.6	0.4	10.4	5.0	14.4	27.8	0.7	12.0
	4-9	Eg1	4.5	0.99	<5	0.9	0.5	0.0	0.1	3.0	0.2	6.5	4.7	8.0	18.8	1.3	63.8
	9-18	Eg2	4.3	0.32	<5	0.4	0.7	0.1	0.1	4.0	0.5	8.0	5.8	9.3	14.0	1.1	69.0
	18-30	B/Eg	4.3	0.24	<5	0.4	0.9	0.1	0.2	6.8	0.0	10.4	8.4	12.0	13.3	1.7	81.0
	30-48	Btg1	4.2	0.32	<5	1.0	1.9	0.1	0.5	10.3	0.5	16.5	14.3	20.0	17.5	2.5	72.0
	48-65	Btg2	4.4	0.41	<5	1.5	2.2	0.2	0.5	8.1	0.6	13.1	13.1	18.3	24.0	2.7	61.8
Myatt fine sandy loam:[1] (S86LA-63-15)*	0-4	A	5.0	3.28	<5	1.3	0.6	0.1	0.1	1.8	0.3	11.4	4.2	13.5	15.6	0.7	42.9
	4-10	Eg	4.6	0.54	<5	0.5	0.5	0.1	0.0	2.5	0.3	7.4	3.9	8.5	12.9	0.0	64.1
	10-26	Btg1	4.7	0.19	<5	0.2	0.5	0.1	0.1	4.1	0.1	9.3	5.1	10.2	8.8	1.0	80.4
	26-38	Btg2	4.9	0.32	<5	0.0	0.5	0.1	0.2	5.5	0.0	10.3	6.3	11.1	7.2	1.8	87.3
	38-58	Btg3	4.8	0.10	<5	0.4	0.9	0.1	0.3	6.2	0.2	11.0	8.1	12.7	13.4	2.4	76.5
	58-60	Cg	4.8	0.06	<5	0.7	1.2	0.1	0.4	5.8	0.2	9.0	8.4	11.5	20.9	3.5	69.0
Ochlockonee sandy loam:[1] (S86LA-63-27)	0-5	A	6.0	0.54	16	2.3	0.6	0.1	0.0	0.0	0.2	4.0	3.2	7.0	42.9	0.0	0.0
	5-18	C1	5.2	0.41	11	2.1	0.6	0.0	0.0	0.2	0.2	4.8	3.1	7.5	36.0	0.0	6.5
	18-38	C2	4.8	0.15	13	0.7	0.3	0.0	0.0	0.4	0.3	4.0	1.7	5.0	20.0	0.0	23.5
	38-60	C3	4.6	0.19	10	0.8	0.2	0.0	0.0	0.6	0.4	4.2	2.0	5.2	19.0	0.0	30.0

See footnotes at end of table.

TABLE 18.--FERTILITY TEST DATA FOR SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	pH 1:1 H_2O	Organic matter content	Extractable phosphorus	Exchangeable cations: Ca	Mg	K	Na	Al	H	Total acidity	Effective cation-exchange capacity	Cation-exchange capacity (sum)	Base saturation (sum)	Saturation: Sum of cation-exchange capacity Na	Saturation: Effective cation-exchange capacity Al
	In			Pct	Ppm	--Milliequivalents/100 grams of soil--									Pct	Pct	Pct
Olivier silt loam:[1] (S86LA-63-28)	0-5	Ap	5.0	3.11	68	4.3	2.0	0.3	0.1	0.2	0.2	13.0	7.1	19.7	34.0	0.5	2.8
	5-8	E	5.2	1.21	9	4.0	1.8	0.1	0.1	0.2	0.4	10.1	6.6	16.1	37.3	0.6	3.0
	8-18	Bt1	4.9	0.50	<5	2.1	1.5	0.1	0.2	3.7	0.2	11.7	7.8	15.6	25.0	1.3	47.4
	18-23	Bt2	5.0	0.32	<5	1.7	2.6	0.2	0.4	7.2	0.0	15.8	12.1	20.7	23.7	1.9	59.5
	23-39	Btx1	5.3	0.15	<5	2.4	4.5	0.3	0.9	7.5	0.0	15.4	15.6	23.5	34.5	3.8	48.1
	39-63	Btx2	5.2	0.15	<5	3.1	6.0	0.2	1.2	3.7	0.1	10.8	14.3	21.3	49.3	5.6	25.9
Olivier silt loam:[8] (S86LA-63-34)	0-4	Ap	5.1	1.38	8	2.2	0.5	0.1	0.0	1.1	0.3	9.3	4.2	12.1	23.1	0.0	26.2
	4-11	Bt1	4.9	0.28	6	1.9	0.4	0.0	0.0	4.0	0.2	8.7	6.5	11.0	20.9	0.0	61.5
	11-22	Bt2	4.8	0.15	9	1.6	0.4	0.0	0.0	4.2	0.2	9.0	6.4	11.0	18.2	0.0	65.6
	22-30	B/E	4.8	0.06	15	1.9	1.0	0.1	0.1	6.7	0.3	12.0	10.1	15.1	20.5	0.7	66.3
	30-48	Bx1	5.1	0.01	74	2.5	2.4	0.1	0.3	6.3	0.3	11.4	11.9	16.7	31.7	1.8	52.9
	48-61	Bx2	5.3	0.01	91	2.2	2.2	0.2	0.4	6.7	0.1	11.4	11.8	16.4	30.5	2.4	56.8
Ouachita silt loam:[1] (S86LA-63-26)	0-5	Ap	4.5	1.25	32	2.1	0.5	0.1	0.0	3.2	0.3	14.8	6.2	17.5	15.4	0.0	51.6
	5-12	Bw1	4.3	0.63	19	0.7	0.3	0.1	0.1	5.1	0.3	16.5	6.6	17.7	6.8	0.6	77.3
	12-32	Bw2	4.4	0.63	21	0.6	0.3	0.1	0.0	4.4	0.4	13.6	5.8	14.6	6.8	0.0	75.9
	32-60	Bw3	4.4	0.54	21	0.6	0.3	0.2	0.0	3.9	0.7	12.1	5.7	13.2	8.3	0.0	68.4
Springfield silt loam:[1] (S86LA-63-29)	0-3	A	4.7	2.00	6	1.9	0.8	0.1	0.0	1.4	0.4	10.6	4.6	13.4	20.9	0.0	30.4
	3-10	Eg1	4.6	0.54	<5	1.2	0.7	0.1	0.0	2.6	0.2	9.7	4.8	11.7	17.1	0.0	54.2
	10-13	Eg2	4.9	0.63	<5	1.3	1.6	0.2	0.2	4.1	0.4	12.8	7.8	16.1	20.5	1.2	52.6
	13-20	Btg	5.0	0.68	<5	2.8	6.0	0.4	0.7	8.4	0.2	18.7	18.5	28.6	34.6	2.4	45.4
	20-31	Bt1	5.4	0.37	<5	3.6	7.8	0.2	0.9	2.7	0.2	11.9	15.4	24.4	51.2	3.7	17.5
	31-60	Bt2	7.1	0.01	<5	4.7	9.4	0.2	1.4	0.0	0.2	4.8	15.9	20.5	76.6	6.8	0.0

See footnotes at end of table.

TABLE 18.--FERTILITY TEST DATA FOR SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	pH 1:1 H_2O	Organic matter content	Extractable phosphorus	Exchangeable cations: Ca	Mg	K	Na	Al	H	Total acidity	Effective cation-exchange capacity	Cation-exchange capacity (sum)	Base saturation (sum)	Saturation: Sum of cation-exchange capacity Na	Effective cation-exchange capacity Al
	In			Pct	Ppm	Milliequivalents/100 grams of soil									Pct	Pct	Pct
Stough fine sandy loam:[1] (S86LA-63-17)	0-4	A	4.8	3.42	<5	2.5	0.5	0.1	0.0	0.5	0.3	9.9	3.9	13.0	23.8	0.0	12.8
	4-7	E	4.8	0.63	<5	1.2	0.4	0.1	0.0	0.7	0.3	4.9	2.7	6.6	25.8	0.0	25.9
	7-14	Bt	5.1	0.15	<5	0.5	3.3	0.2	0.4	1.1	0.3	11.6	5.8	16.0	27.5	2.5	19.0
	14-22	Btx1	5.3	0.15	<5	0.5	4.3	0.1	0.5	5.1	0.0	8.4	10.5	13.8	39.1	3.6	48.6
	22-31	Btx2	5.3	0.15	<5	0.4	5.6	0.1	0.6	2.8	0.4	7.2	9.9	13.9	48.2	4.3	28.3
	31-47	Btx3	5.4	0.15	<5	0.4	3.3	0.1	0.5	2.3	0.1	4.6	6.7	8.9	48.3	5.6	34.3
	47-60	Btx4	5.0	0.10	<5	0.4	0.9	0.0	0.1	1.5	0.3	3.8	3.2	5.2	26.9	1.9	46.9

[1] Representative pedon for the survey area. For the description and location see the section "Soil Series and Their Morphology."

[2] This Bude pedon is similar to the Bude series, but the organic matter content of the surface layer is slightly higher than allowed in the series range. This pedon is not considered a taxadjunct because this difference is within the normal error of observation. The sample site is 50 feet east of the representative pedon for the survey area. For location of the representative pedon see the section "Soil Series and Their Morphology."

[3] This Calhoun pedon is located 0.25 miles east of Walker, 2,700 feet south of Interstate 12, about 5,100 feet east of Louisiana Highway 447, Spanish Land Grant sec. 6, T. 7 S., R. 4 E. This pedon is similar to the Calhoun series, but the exchangeable sodium percentage in the Btgn1 and Btgn2 horizons is slightly higher than allowed in the series range. The pedon is not considered a taxadjunct because this difference is within the normal error of observation.

[4] This Colyell pedon is located 3.0 miles northeast of Killian, 8,300 feet east of Louisiana Highway 22, about 3,200 feet south of the Tickfaw River, Spanish Land Grant sec. 39, T. 8 S., R. 7 E. This pedon is a taxadjunct to the Colyell series because the exchangeable sodium percentage at a depth of 30 to 50 inches is lower than allowed in the series range.

[5] This Colyell pedon is located 50 feet north of the representative pedon.

[6] This Encrow pedon is located 15 feet east of the typical pedon for the Encrow series.

[7] This Guyton pedon is located 1.25 miles southeast of Magnolia, 3,900 feet south of Louisiana Highway 442, about 4,300 feet west of Louisiana Highway 1036, sec. 4, T. 6 S., R. 5 E. This Guyton pedon is a taxadjunct to the Guyton series because the base saturation at a depth of 50 inches below the top of the argillic horizon is slightly less than 35 percent.

[8] This Olivier pedon is located 0.5 miles north of French Settlement, 1,600 feet north of Louisiana Highway 444, about 300 feet east of Louisiana Highway 16, sec. 41, T. 8 S., R. 4 E. This pedon is a taxadjunct to the Olivier series because the base saturation at a depth of 30 inches below the top of the fragipan is slightly less than 35 percent.

TABLE 19.--PHYSICAL TEST DATA FOR SELECTED SOILS

(Dashes indicate analyses not made)

Soil name and sample number	Horizon	Depth	Particle-size distribution: Sand: Very coarse (2.0-1.0 mm)	Sand: Coarse (1.0-0.5 mm)	Sand: Medium (0.5-0.25 mm)	Sand: Fine (0.25-0.1 mm)	Sand: Very fine (0.1-0.05 mm)	Silt (0.25-0.002 mm)	Clay (0.002 mm)	Water content: 1/3 bar	Water content: 15 bar	Water content: Water retention	Bulk density: Air-dry	Bulk density: Oven-dry	Bulk density: Field moisture
		In	Pct							Pct (wt)			g/cm^3	g/cm^3	g/cm^3
Colyell silt loam:[1] (S86LA-63-38)	A	0-3	0.2	2.1	2.1	2.2	3.1	79.4	10.9	30.2	12.4	17.8	1.16	1.19	1.10
	E	3-8	1.4	4.1	1.0	0.5	1.4	80.3	11.3	23.1	6.8	16.3	1.46	1.51	1.45
	EB	8-12	1.8	3.5	0.9	0.4	1.4	73.0	19.0	28.0	9.4	18.6	1.45	1.48	1.39
	2B/E	12-15	0.2	0.9	0.4	0.2	0.8	55.3	42.2	37.8	19.2	18.6	1.49	1.50	1.38
	2Bt1	15-23	0.0	0.3	0.2	0.1	0.7	49.8	48.9	42.2	21.7	20.5	1.75	1.77	1.47
	2Bt2	23-39	0.0	0.1	0.1	0.2	1.0	64.4	34.2	34.8	16.8	18.0	1.78	1.79	1.70
	3Btn1	39-48	0.0	0.1	0.2	0.2	1.0	62.5	36.0	33.5	17.3	16.2	1.98	1.99	1.81
	3Btn2	48-60	0.1	0.2	0.2	0.3	1.4	62.5	35.3	31.9	18.9	13.0	1.89	1.89	1.75
Encrow silt loam:[1] (S86LA-63-39)	A	0-4	0.3	0.7	2.0	2.6	4.3	76.3	13.8	32.1	12.0	20.1	1.23	1.21	1.14
	Eg	4-12	0.1	0.1	0.3	1.7	4.1	77.3	16.4	28.8	9.9	18.9	1.46	1.42	1.36
	E/Btg	12-27	0.0	0.2	0.4	1.3	3.4	72.6	22.1	30.0	11.9	18.1	1.46	1.43	1.39
	2Btg1	27-36	0.0	0.1	0.2	1.2	1.0	70.6	26.9	30.3	14.3	16.0	1.66	1.60	1.56
	2Btg2	36-42	0.0	0.0	0.1	0.6	1.5	51.6	46.2	41.1	23.6	17.5	1.82	1.83	1.64
	2Btg3	42-48	0.1	0.1	0.1	0.7	1.7	59.7	37.6	34.7	19.3	15.4	1.83	1.85	1.74
	2BCng	48-60	0.3	0.3	0.3	1.0	2.6	59.8	35.8	23.5	18.9	4.6	1.90	1.92	1.80
Natalbany silty clay loam:[1] (S85LA-63-3)	A	0-5	0.0	0.0	1.2	2.4	3.4	58.0	35.0	36.4	23.0	13.4	1.64	1.68	1.25
	Btg1	5-17	0.1	0.1	0.4	1.6	3.1	51.2	43.5	37.9	23.9	14.0	1.71	1.76	1.27
	Btg2	17-32	0.0	0.1	0.2	0.9	2.0	35.3	61.5	45.4	---	---	1.77	1.85	1.14
	Btg3	32-42	0.0	0.0	0.2	0.8	2.0	38.7	58.3	43.0	29.2	13.8	1.87	1.95	1.27
	BCg	42-60	0.0	0.0	0.2	0.9	1.8	44.8	52.3	40.2	25.0	15.2	2.00	2.04	1.61
	Cg	60-80	0.0	0.0	0.1	1.0	1.9	48.2	48.8	38.3	26.3	12.0	2.03	2.10	1.50
Satsuma silt loam:[2] (S86LA-63-40)	Ap	0-5	1.3	2.2	3.6	7.2	3.6	72.0	10.1	15.0	10.7	4.3	1.28	1.28	1.25
	Bw	5-10	1.5	1.4	1.2	4.3	2.7	76.0	12.9	11.4	7.8	3.6	1.55	1.61	1.54
	B/E	10-15	0.1	0.1	0.3	1.7	1.5	55.5	40.8	25.0	18.7	6.3	1.52	1.54	1.41
	Bt1	15-29	0.1	0.4	0.5	2.4	1.2	58.3	37.1	33.8	17.7	16.1	1.61	1.61	1.40
	2Bt2	29-41	0.4	0.2	1.2	9.1	3.6	63.9	21.6	26.5	11.7	14.8	1.61	1.66	1.57
	2Btnx	41-56	0.7	0.5	3.7	26.6	10.1	44.6	13.8	16.0	6.7	9.3	1.72	1.75	1.66
	2BCn	56-65	0.0	0.0	3.1	30.7	11.3	41.2	13.7	15.0	6.6	8.4	1.72	1.73	1.67

See footnotes at end of table.

TABLE 19.--PHYSICAL TEST DATA FOR SELECTED SOILS--Continued

Soil name and sample number	Horizon	Depth	Particle-size distribution: Sand: Very coarse (2.0-1.0 mm)	Coarse (1.0-0.5 mm)	Medium (0.5-0.25 mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Silt (0.25-0.002 mm)	Clay (0.002 mm)	Water content: 1/3 bar	15 bar	Water retention	Bulk density: Air-dry	Oven-dry	Field moisture
		In	Pct							Pct (wt)			g/cm^3	g/cm^3	g/cm^3
Springfield silt loam:[3] (S85LA-63-2)	A	0-5	0.0	0.0	0.6	2.5	8.3	74.3	14.3	29.2	12.5	16.7	1.32	1.34	1.25
	Eg1	5-18	0.0	0.6	0.3	0.8	6.7	66.9	24.7	28.4	15.0	13.4	1.49	1.51	1.42
	Eg2	18-23	0.4	0.3	0.2	0.6	5.6	69.2	23.7	28.4	13.3	15.1	1.51	1.52	1.43
	Btg1	23-38	0.1	0.1	0.1	0.5	3.4	49.4	46.4	34.8	22.8	12.0	1.77	1.82	1.47
	Btg2	38-44	0.1	0.2	0.2	0.8	5.0	59.9	33.8	30.0	20.4	9.6	1.87	1.90	1.70
	Bt1	44-57	0.1	0.2	0.3	0.9	5.1	64.6	28.8	27.9	18.4	9.5	1.78	1.80	1.69
	Bt2	57-72	0.2	0.3	0.3	0.9	4.8	65.5	28.0	27.0	17.6	9.4	1.77	1.78	1.67
Toula silt loam:[4] (S85LA-63-6)	A	0-6	0.9	1.5	2.1	2.5	4.8	79.9	8.3	22.4	6.9	15.5	1.35	1.36	1.32
	Bt1	6-11	0.8	0.9	0.8	1.0	3.2	73.1	20.2	23.2	8.5	14.7	1.69	1.71	1.64
	Bt2	11-25	0.5	0.4	0.4	0.5	1.8	66.5	29.9	26.5	11.1	15.4	1.67	1.68	1.66
	Bt3	25-31	0.6	3.9	0.3	0.6	2.5	67.5	24.6	24.9	9.8	15.1	1.66	1.67	1.59
	Btx1	31-36	0.7	5.0	0.5	1.1	3.5	68.7	20.5	25.8	8.6	17.2	1.68	1.70	1.67
	2Btx2	36-49	0.3	8.0	0.6	1.1	5.5	64.2	20.3	23.8	8.1	15.7	1.79	1.79	1.78
	2Btx3	49-65	0.5	3.1	0.4	1.3	7.4	69.4	17.9	23.2	8.1	15.1	1.79	1.80	1.76
Verdun silt loam:[4] (S85LA-63-5)	A	0-4	0.7	3.5	7.4	2.7	2.5	73.1	10.1	---	---	---	1.28	1.29	1.24
	E/Bg	4-12	1.0	3.5	5.9	1.6	1.6	72.6	13.8	---	---	---	1.65	1.85	1.57
	Btng	12-22	0.3	2.0	4.9	1.4	1.5	65.7	24.2	---	---	---	1.82	1.85	1.59
	Btn	22-31	0.4	1.8	3.8	0.9	0.3	58.2	34.6	---	---	---	1.81	1.84	1.66
	BCn1	31-45	0.3	2.5	5.8	1.1	1.3	66.2	22.8	---	---	---	1.83	1.85	1.69
	BCn2	45-60	0.5	4.7	10.0	1.8	1.7	58.7	22.6	---	---	---	1.83	1.88	1.77
	Cnk	60-70	0.6	4.5	10.2	1.8	1.8	58.9	22.2	---	---	---	1.85	1.88	1.75
Verdun silt loam:[5] (S85LA-63-4)	A	0-8	0.3	0.6	3.7	15.3	8.6	67.5	4.0	---	---	---	1.47	1.47	1.43
	Eg	8-18	0.0	0.1	1.6	10.7	5.8	73.7	8.1	---	---	---	1.74	1.75	1.71
	E/B	18-26	0.0	0.1	1.4	9.7	5.6	70.2	13.0	---	---	---	1.65	1.66	1.60
	B/E	26-34	0.3	0.3	1.3	8.4	5.0	63.7	21.0	---	---	---	1.76	1.81	1.60
	Btn1	34-52	0.3	0.3	1.3	8.3	5.0	62.4	22.4	---	---	---	1.81	1.85	1.68
	Btn2	52-64	0.3	0.3	1.3	9.5	5.3	61.8	21.5	---	---	---	1.86	1.88	1.71

[1] Typical pedon for the series. For the description and location see the section "Soil Series and Their Morphology."
[2] Sample site is 1.75 miles southeast of Watson, 0.25 miles north of Louisiana Highway 1024, about 0.66 miles west of Molar Creek, sec. 32, T. 5 S., R. 3 E.
[3] Sample site is 2.8 miles southeast of Frost, 4,500 feet south of Gum Swamp, 900 feet east of Indian Camp Ridge, 100 feet east of dirt road, sec. 3, T. 8 S., R. 5 E.
[4] Typical pedon for the survey area. For the description and location see the section "Soil Series and Their Morphology."
[5] This Verdun pedon is a taxadjunct to the Verdun series because the reaction of the A horizon is lower than allowed in the series range. Also, the family mineralogy class is siliceous rather than mixed. The sample site is 2.0 miles east of Frost, 400 feet west of Gum Swamp, 32 feet east of Greasy Branch, sec. 28, T. 7 S., R. 5 E.

TABLE 20.--CHEMICAL TEST DATA FOR SELECTED SOILS

(Dashes indicate analyses not made. The symbol < means less than)

Soil name and sample number	Horizon	Depth	Extractable cations				Extractable acidity	Cation-exchange capacity	Base saturation[1]	Organic matter	pH			Extractable iron	Extractable aluminum	Extractable hydrogen	Extractable phosphorus	
			Ca	Mg	K	Na		NH4OAc			1:1 H_2O	1:1 KCl	1:2 $CaCl_2$				Bray 1	Bray 2
		In	Meq/100g				Pct	Pct		Pct				Pct	Meq/100g		Ppm	
Colyell silt loam:[2] (S86LA-63-38)	A	0-3	3.9	0.2	0.1	0.2	17.4	17.0	25.9	1.40	4.6	3.8	4.0	0.6	1.8	1.2	5	5
	E	3-8	0.6	0.1	0.0	0.1	7.8	6.4	12.5	0.16	4.9	3.7	4.0	0.6	2.3	0.7	5	5
	EB	8-12	0.7	0.2	0.1	0.2	10.8	8.6	14.0	0.37	4.7	3.5	3.9	0.8	4.7	0.5	5	5
	2B/E	12-15	2.5	4.6	0.2	0.7	18.6	19.0	42.1	0.24	5.0	3.5	4.1	1.6	10.3	0.7	5	5
	2Bt1	15-23	2.1	3.0	0.2	1.2	21.0	22.2	29.3	0.17	5.0	3.5	4.2	1.6	10.6	0.4	5	5
	2Bt2	23-39	4.1	9.0	0.2	1.7	7.8	19.0	78.9	0.09	5.1	3.7	4.5	0.8	2.2	0.4	5	5
	3Btn1	39-48	5.7	15.3	0.1	3.3	4.8	20.6	118.4	0.09	5.4	4.5	5.1	0.8	0.0	0.2	5	5
	3Btn2	48-60	5.9	11.6	0.1	3.3	4.2	18.2	114.8	0.04	5.8	4.8	5.9	0.4	0.0	0.2	5	6
Encrow silt loam:[2] (S86LA-63-39)	A	0-4	1.7	0.5	0.1	0.1	10.8	8.6	27.9	1.40	4.7	3.6	3.9	0.8	4.0	1.0	8	8
	Eg	4-12	0.5	0.4	0.1	0.0	8.4	6.2	16.1	0.51	4.6	3.5	3.8	0.8	4.5	0.3	5	6
	E/Btg	12-27	2.0	0.9	0.1	0.1	7.8	8.2	37.8	0.25	4.7	3.5	4.0	0.4	4.9	0.5	5	5
	2Btg1	27-36	3.7	1.0	0.1	0.1	10.2	10.2	48.0	0.24	4.1	3.4	3.9	0.6	5.8	0.2	5	5
	2Btg2	36-42	9.7	0.5	0.2	0.5	17.4	20.4	53.4	0.26	4.3	3.4	3.9	1.3	9.0	0.6	5	5
	2Btg3	42-48	12.5	0.6	0.3	0.7	12.6	17.4	81.0	0.10	4.4	3.4	3.9	0.8	6.1	0.5	5	5
	2BCng	48-60	15.8	0.7	0.1	1.7	10.5	17.2	106.4	0.05	4.4	3.4	4.1	0.6	3.6	0.4	5	5
Natalbany silty clay loam:[2] (S85LA-63-3)	A	0-5	6.6	3.4	0.2	0.5	15.6	24.7	43.3	1.44	4.7	3.5	4.3	0.4	4.3	0.4	<1	8
	Btg1	5-17	6.6	3.4	0.2	0.5	18.2	23.5	45.5	0.74	4.6	3.3	4.1	0.5	7.4	0.1	<1	8
	Btg2	17-32	9.2	4.4	0.3	0.9	23.0	37.1	39.9	0.55	4.5	3.3	4.1	0.8	11.4	0.0	<1	4
	Btg3	32-42	13.2	5.7	0.3	1.1	18.0	36.9	55.0	0.19	4.4	3.3	4.1	0.4	7.7	0.2	<1	4
	BCg	42-60	17.2	7.1	0.3	1.3	12.2	30.3	85.5	0.08	4.5	3.4	4.4	0.3	1.0	0.2	<1	4
	Cg	60-80	20.0	9.1	0.3	1.1	6.8	29.8	102.3	0.02	6.7	5.5	4.6	0.3	0.0	0.2	8	176
Satsuma silt loam:[3] (S86LA-63-40)	A	0-5	2.6	0.8	0.1	0.3	10.2	7.8	48.7	1.26	5.0	4.0	4.3	0.7	0.4	0.6	6	5
	Bw	5-10	0.4	0.5	0.0	0.9	6.0	6.6	27.3	0.05	5.3	3.8	4.0	0.8	2.7	0.1	5	5
	B/E	10-15	0.3	3.5	0.1	0.9	16.8	17.8	27.0	0.08	5.1	3.5	4.0	1.6	9.4	0.6	5	5
	Bt1	15-29	0.1	5.6	0.1	1.8	13.8	16.0	47.5	0.07	5.2	3.6	4.1	1.6	7.7	0.3	5	5
	2Bt2	29-41	0.1	5.8	0.1	2.2	7.8	10.8	75.9	0.04	5.4	3.6	4.4	0.8	2.9	0.3	5	5
	2Btnx	41-56	0.1	3.5	0.0	1.2	4.2	4.8	100.0	0.03	5.4	3.9	4.4	0.4	0.5	0.3	5	5
	2BCn	56-65	0.1	2.6	0.0	0.6	1.8	4.4	75.0	0.01	5.4	3.9	4.4	0.5	0.5	0.5	5	5

See footnotes at end of table.

TABLE 20.--CHEMICAL TEST DATA FOR SELECTED SOILS--Continued

Soil name and sample number	Horizon	Depth	Extractable cations				Extractable acidity	Cation-exchange capacity NH$_4$OAc	Base saturation[1]	Organic matter	pH			Extractable iron	Extractable aluminum	Extractable hydrogen	Extractable phosphorus	
			Ca	Mg	K	Na					1:1 H_2O	1:1 KCl	1:2 $CaCl_2$				Bray 1	Bray 2
		In	Meq/100g				Pct	Pct		Pct				Pct	Meq/100g		Ppm	
Springfield silt loam:[4] (S85LA-63-2)	A	0-5	2.2	0.8	0.1	0.4	9.1	10.6	23.0	1.02	4.7	3.7	4.2	0.5	2.0	0.2	<1	<1
	Eg1	5-18	1.2	0.5	0.2	0.5	10.3	10.6	22.6	0.32	4.7	3.7	4.0	0.8	4.1	0.3	<1	<1
	Eg2	18-23	1.0	0.6	0.1	0.7	10.3	10.1	23.8	0.25	4.8	3.5	4.0	0.8	4.6	0.4	<1	<1
	Btg1	23-38	2.2	2.9	0.1	0.6	16.9	23.2	29.3	0.24	4.9	3.4	4.2	1.3	9.0	0.0	<1	<1
	Btg2	38-44	3.8	4.6	0.1	2.0	9.5	19.3	54.4	0.10	5.1	3.6	4.5	1.2	3.4	0.2	<1	4
	Bt1	44-57	5.6	6.0	0.1	2.5	4.0	17.3	82.1	0.00	6.2	4.8	5.9	0.9	0.0	0.2	<1	4
	Bt2	57-72	5.6	6.0	0.2	2.3	2.5	15.5	94.2	0.00	6.6	5.3	6.4	0.9	0.0	0.2	<1	2
Toula silt loam:[5] (S85LA-63-6)	A	0-6	2.8	0.8	0.1	0.4	8.4	11.9	34.5	1.58	5.6	3.8	5.2	0.8	0.0	0.2	<1	<1
	Bt1	6-11	4.4	1.1	0.1	0.6	8.6	9.7	63.9	0.24	5.1	4.5	4.5	1.1	1.3	0.3	<1	<1
	Bt2	11-25	3.0	1.3	0.1	0.5	14.0	14.5	33.8	0.11	4.9	3.6	4.2	1.6	6.2	0.0	<1	<1
	Bt3	25-31	1.8	1.3	0.1	0.5	12.8	13.4	27.6	0.04	5.0	3.6	4.1	1.3	6.1	0.1	<1	<1
	Btx1	31-36	1.2	1.1	0.1	0.4	11.2	12.6	22.2	0.02	5.0	3.5	4.1	1.0	5.5	0.2	<1	<1
	2Btx2	36-49	0.6	1.1	0.1	0.6	8.7	10.8	22.2	0.00	5.1	3.5	4.0	1.1	5.0	0.1	<1	<1
	2Btx3	49-65	1.0	1.2	0.1	0.5	7.2	9.7	28.9	0.00	5.0	3.4	4.1	1.1	4.0	0.4	<1	<1
Verdun silt loam:[5] (S85LA-63-5)	A	0-4	2.2	1.1	0.1	0.6	7.4	8.4	47.6	0.91	5.2	3.9	4.5	0.6	0.8	0.2	<1	4
	E/Bg	4-12	2.4	1.8	0.1	1.7	4.6	7.9	75.9	0.29	5.9	4.4	5.3	0.8	0.0	0.2	<1	2
	Btng	12-22	4.2	4.8	0.2	6.6	1.8	17.2	91.9	0.16	8.3	6.8	7.9	1.0	0.0	0.0	<1	2
	Btn1	22-31	5.4	5.3	0.1	6.3	4.2	20.3	84.2	0.05	7.8	6.3	7.6	0.9	0.0	0.0	<1	<1
	Btn2	31-45	3.4	4.6	0.1	6.6	0.8	15.0	98.0	0.00	8.4	6.7	8.1	0.9	0.0	0.0	<1	<1
	Btn3	45-60	2.8	4.1	0.1	6.3	0.0	12.8	103.9	0.00	8.5	6.8	8.4	0.8	0.0	0.0	<1	<1
	Cnk	60-70	2.8	3.9	0.1	6.0	0.0	12.6	101.6	0.00	8.6	6.9	8.3	0.7	0.0	0.0	<1	<1

See footnotes at end of table.

TABLE 20.--CHEMICAL TEST DATA FOR SELECTED SOILS--Continued

Soil name and sample number	Horizon	Depth	Extractable cations				Extractable acidity	Cation-exchange capacity NH$_4$OAc	Base saturation[1] NH$_4$OAc	Organic matter	pH			Extractable iron	Extractable aluminum	Extractable hydrogen	Extractable phosphorus	
			Ca	Mg	K	Na					1:1 H$_2$O	1:1 KCl	1:2 CaCl$_2$				Bray 1	Bray 2
		In	----Meq/100g----				Pct	------Pct------		Pct				Pct	--Meq/100g--		-----Ppm-----	
Verdun[6] silt loam:																		
(S85LA-63-4)	A	0-8	1.4	0.6	0.1	1.8	9.0	8.1	48.1	1.39	4.2	3.5	3.9	0.1	1.7	0.5	<1	4
	Eg	8-18	---	---	---	---	1.6	---	---	0.05	6.3	4.9	5.9	0.2	0.0	0.0	<1	4
	E/B	18-26	1.6	2.7	0.1	4.1	2.6	10.7	79.4	0.04	6.7	5.2	6.3	0.4	0.0	0.0	<1	2
	B/E	26-34	4.2	4.7	0.1	5.3	3.6	14.6	97.9	0.01	6.7	5.3	6.6	0.5	0.0	0.0	<1	4
	Btn1	34-52	4.2	4.6	0.1	5.4	3.0	14.3	100.0	0.00	7.2	5.6	6.8	0.6	0.0	0.0	<1	28
	Btn2	52-64	4.0	4.1	0.1	4.7	2.8	9.3	138.7	0.00	7.1	5.9	6.9	0.6	0.0	0.0	<1	20

[1] To calculate percent base saturation by sum of cations, divide the sum of extractable bases by the sum of extractable acidity multiplied by 100.

[2] Typical pedon for the series. For the description and location see the section "Soil Series and Their Morphology."

[3] The sample site is 1.75 miles southeast of Watson, 0.25 miles north of Louisiana Highway 1024, about 0.66 miles west of Molar Creek, sec. 32, T. 5 S., R. 3 E.

[4] The sample site is 2.8 miles southeast of Frost, 4,500 feet south of Gum Swamp, 900 feet east of Indian Camp Ridge, 100 feet east of dirt road, sec. 3, T. 8 S., R. 5 E.

[5] Typical pedon for the survey area. For the description and location see the section "Soil Series and Their Morphology."

[6] This Verdun pedon is a taxadjunct to the Verdun series because the reaction of the A horizon is lower than allowed in the series range. Also, the family mineralogy class is siliceous rather than mixed. The sample site is 2.0 miles east of Frost, 400 feet west of Gum Swamp, 32 feet east of Greasy Branch, sec. 28, T. 7 S., R. 5 E.

TABLE 21.--CLASSIFICATION OF THE SOILS

(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series)

Soil name	Family or higher taxonomic class
Abita	Fine-silty, siliceous, thermic Glossaquic Paleudalfs
Aquents	Aquents
Arents	Arents
Barbary	Very fine, montmorillonitic, nonacid, thermic Typic Hydraquents
*Brimstone	Fine-silty, siliceous, thermic Glossic Natraqualfs
*Bude	Fine-silty, mixed, thermic Glossaquic Fragiudalfs
Cahaba	Fine-loamy, siliceous, thermic Typic Hapludults
Calhoun	Fine-silty, mixed, thermic Typic Glossaqualfs
Colyell	Fine, montmorillonitic, thermic Glossaquic Hapludalfs
Deerford	Fine-silty, mixed, thermic Albic Glossic Natraqualfs
Dexter	Fine-silty, mixed, thermic Ultic Hapludalfs
Encrow	Fine, montmorillonitic, thermic Typic Glossaqualfs
Gilbert	Fine-silty, mixed, thermic Typic Glossaqualfs
Guyton	Fine-silty, siliceous, thermic Typic Glossaqualfs
Maurepas	Euic, thermic Typic Medisaprists
Myatt	Fine-loamy, siliceous, thermic Typic Ochraquults
Natalbany	Fine, montmorillonitic, thermic Vertic Ochraqualfs
Ochlockonee	Coarse-loamy, siliceous, acid, thermic Typic Udifluvents
Olivier	Fine-silty, mixed, thermic Aquic Fragiudalfs
Ouachita	Fine-silty, siliceous, thermic Fluventic Dystrochrepts
Satsuma	Fine-silty, siliceous, thermic Glossaquic Hapludalfs
Springfield	Fine, mixed, thermic Aeric Albaqualfs
Stough	Coarse-loamy, siliceous, thermic Fragiaquic Paleudults
Toula	Fine-silty, siliceous, thermic Typic Fragiudults
*Verdun	Fine-silty, mixed, thermic Glossic Natraqualfs

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