United States
Department of
Agriculture

In cooperation
with Texas
Agricultural
Experiment
Station

Natural
Resources
Conservation
Service

Soil Survey of Jefferson and Orange Counties, Texas

How To Use This Soil Survey

General Soil Map

The general soil map, which is a color map, 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.

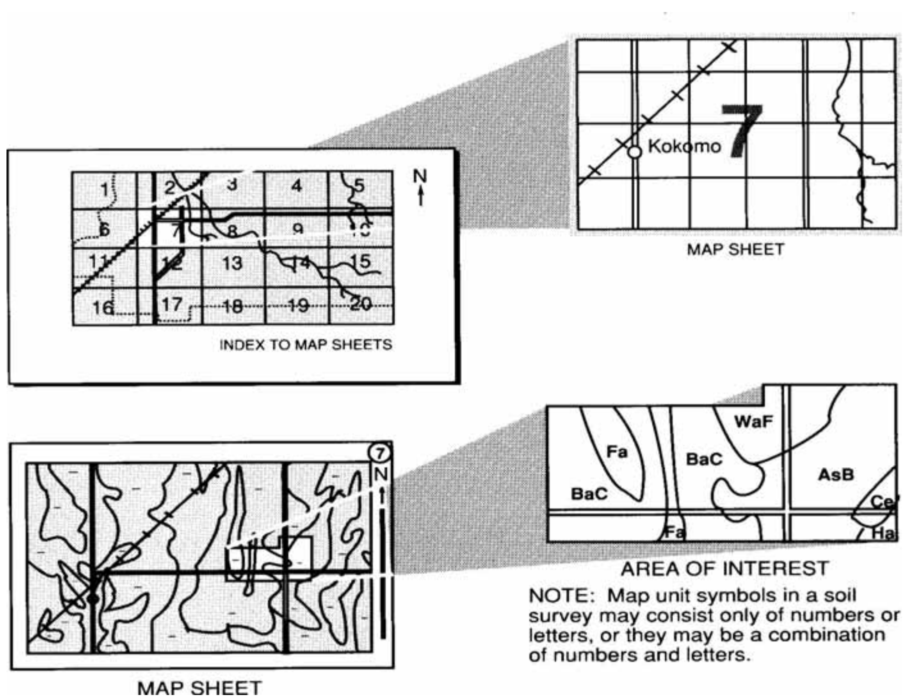
Detailed Soil Maps

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

To find information about your area of interest, locate that area on the **Index to Map Sheets**. Click the mouse on the number of the map sheet, the link will take you to that sheet.

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

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **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 Natural Resources Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1994. Soil names and descriptions were approved in 1996. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1994. This survey was made cooperatively by the Natural Resources Conservation Service and the Texas Agricultural Experiment Station. The survey is part of the technical assistance furnished to the Coastal, Lower Sabine-Neches, and part of the Trinity Bay Soil and Water Conservation Districts.

Cover: Small ponds are scattered throughout the coastal marshlands of Jefferson and Orange Counties, and are used extensively by wildlife. The soil is Creole mucky peat, 0 to 1 percent slopes, frequently flooded, tidal.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service homepage on the World Wide Web. The address is http://www.nrcs.usda.gov

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June 2006

Foreword

This soil survey contains information that affects land use planning in this survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, 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.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

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. 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 Natural Resources Conservation Service or Texas Cooperative Extension.

Larry D. Butler
State Conservationist
Natural Resources Conservation Service

Soil Survey of Jefferson and Orange Counties, Texas

By
Gerald Crenwelge, Natural Resources Conservation Service

Fieldwork by
Sherrill Alexander, Gerald W. Crenwelge, Raymond Dolezel, Edward L. Griffin, Kirby Griffith, Ricky E. Lambert, Wesley L. Miller, Dennis Mulligan, Alan C. Peer, and Levi J. Steptoe, Jr.

United States Department of Agriculture, Natural Resources Conservation Service,
In cooperation with
Texas Agricultural Experiment Station

Jefferson and Orange Counties are in southeastern Texas (fig. 1). Jefferson County has a total area of 904 square miles, or 635,053 acres. Beaumont is the county seat and largest city for Jefferson County. Other towns in Jefferson County include Bevil Oaks, China, Fannett, Groves, Nederland, Nome, Port Neches, and Port Arthur. In 2000, the population of Jefferson County was 252,051. Orange County has a total area of 380 square miles, or 231,751 acres. Orange is the county seat and largest city for Orange County. Other towns in Orange County include Bridge City, Mauriceville, Pine Forest, Pinehurst, Rose City, Vidor, and West Orange. In 2000, the population of Orange County was 84,966. (13) The land surface is nearly level throughout the area. Elevations range from about sea level in the southern part along the Gulf of Mexico to about 50 feet above sea level in the northern part.

The major drainage system in Jefferson County is the Neches River in the eastern part. The major drainage systems in Orange County are the Neches River in the western part and the Sabine River in the eastern part. These rivers and other minor drainage systems empty into the Gulf of Mexico at Sabine Lake.

Jefferson and Orange Counties are in three major land resource areas (MLRA's). About 50 percent of the area lies within the Gulf Coast Prairies MLRA. About 35 percent of the area is in the Gulf Coast Marsh MLRA. About 15 percent of the area lies within the Western Gulf Coast Flatwoods MLRA mostly in the northern part of Orange County. The Gulf Coast Prairie MLRA has mostly dark colored loamy and clayey soils that formed under prairie vegetation. The Gulf Coast Marsh is comprised of sandy, clayey, or loamy soils that are submerged for part of the time with saline or fresh water. The Western Gulf Coast Flatwoods MLRA has mostly light colored loamy and silty soils that formed under pine forest vegetation.

The major land uses in the Gulf Coast Prairies include farming and ranching. The major land use for the Gulf Coast Marsh is wildlife. The major land use for the Western Gulf Coast Flatwoods is woodland.

The first soil survey for Jefferson County, Texas was published in 1915. The second soil survey was of Jefferson County, Texas published in 1960. Both of these surveys were published by the U.S. Department of Agriculture. This survey updates the previous surveys, provides a more detailed soil survey, and contains more interpretative information.

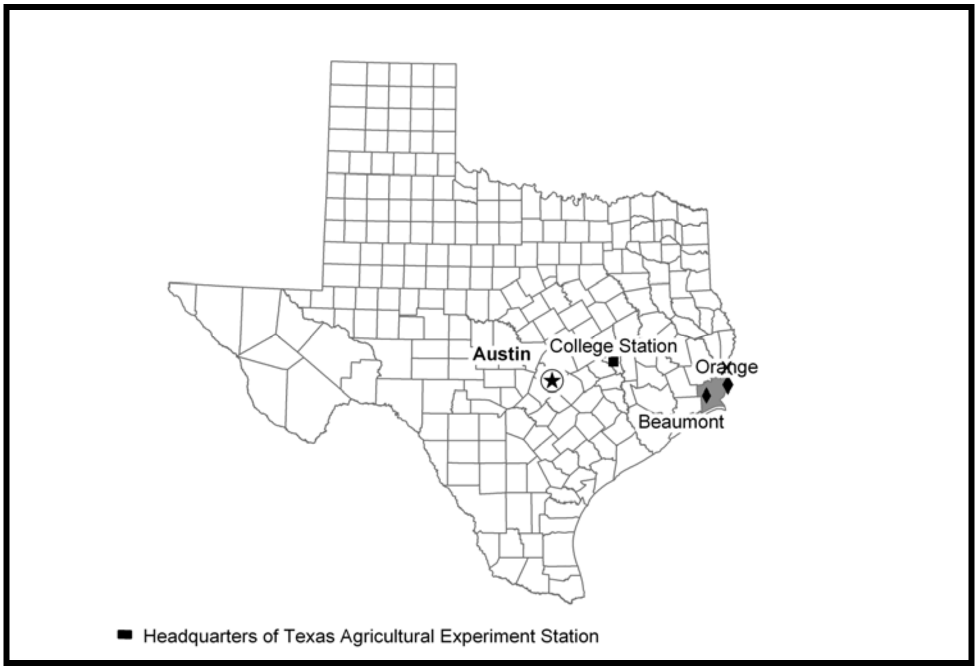

Figure 1.—Location of Jefferson and Orange Counties in Texas.

General Nature of the Survey Area

This section provides general information about Jefferson and Orange Counties. It describes history and development, agriculture, natural resources, and climate.

History and Development of Jefferson County, Texas

W.T. Block prepared this section

The history of Jefferson County prior to 1836 can be quickly divided into two groups; the pre-history or aboriginal period and the Spanish-Mexican period. The predominant, local Indian tribe was actually a loose confederation of about six tribes, known as the Atakapas. The Atakapas likely invaded Southeast Texas from Central Louisiana about 1600, displacing the much taller Karankawa warriors, who retreated farther westward. (11) The Atakapas built six huge burial mounds 60 feet wide, 15 to 20 feet tall, and 450 feet long near present-day Port Neches. (11) The Atakapas likely perished in Jefferson County during the giant hurricane of 1780.

In all, three Spanish expeditions visited extreme southeast Texas, but only two ever reached Jefferson County's boundaries. In 1745, Capt. Joaquin de Orobio's soldiers visited the Orcoquiza village, near present day Wallisville. In July, 1777, Capt. Antonio Gil y Barbo brought Spanish troops to the Atakapas Indian town near present day Port Neches and discovered English incursions at Sabine Pass. In 1785, Don Jose de Evia came to Jefferson County while on a river surveying and mapping expedition.

Jefferson County was originally claimed by Spain. According to tradition, however, the first explorers in the county were French. French traders were active in the area as early as 1718. They traded with the Indians and trapped beaver, muskrat, and black bear in the deep woods and marsh country of the lower Neches River. The Indians were friendly to the French, but hostile to the Spanish.

In the last half of the eighteenth century, English traders established a camp near the present site of Beaumont. They abandoned the site after a short time. To prevent the return of the English, the Spanish established ranches within the ancient preserves of the Atakapas.

As early as 1800, trappers and settlers from the United States began to move into the territory. Early settlement of the area was influenced by the Spanish abandonment of 40,000 head of cattle at Goliad Presidio and 4,000 more at Mission San Juan de Ahumada near Wallisville. By 1830, when the earliest settlers arrived, the increase of these herds were wandering all over Jefferson County, and into Louisiana. Hence, the first Anglo-American settlers quickly learned that all that was needed to begin a cattle ranch was to round up and brand the unclaimed Spanish cattle. (5)

Jefferson County was created as the result of the Texas Consultation of San Felipe in November, 1835. At that time, it was called the "Municipality of Jefferson," and was named after Thomas Jefferson. The political boundaries of the "Municipality of Jefferson," strangely bore the exact geographic boundaries of what later became Orange County. In 1837, the original Jefferson County was created. At its creation, Jefferson County covered an area consisting of modern-day Jefferson, Orange, the southern half of Hardin, and parts of Chambers, and Galveston Counties. With the separations of Orange County in 1852, the southern half of Hardin County (south of Village Creek) in 1858, and eastern Chambers and Galveston Counties, Jefferson County's 945 square mile present day-area and boundaries were set. (19)

Farmers who crossed the Sabine and Neches Rivers in 1840 were much more inclined to settle in a heavily wooded county or walk 200 miles farther into Stephen F. Austin's colony along the Brazos and Colorado Rivers. The early Texas writers around 1840, namely George W. Bonnell, Orceneth Fisher, Arthur Ikin, and Viktor Bracht, generally underrated and criticized the "low quality" of Jefferson County farm lands. Even William Kennedy, the British Consul at Galveston, wrote that Jefferson County's soil was "...comparatively poor, and better adapted to grazing than tillage..." (8). Hence, the new immigrant knew before arriving that he needed to cross Jefferson County and search farther westward for the fertile soils he needed for cotton production. For those who stayed in Jefferson County, the settlers tilled their fields and herded the cattle during the day and set traps on the riverbanks and marshes by night. The furs of raccoons, mink, beaver, and muskrats were in great demand and were more valuable than the agricultural products raised. Since these animals were abundant in Jefferson County, a thriving fur industry was established.

Originally, timber was plentiful in the county. The pioneer lumbermen produced mainly cypress shingles, staves, and other hardwood products. As the number of settlers increased, woodland became an important product in the county.

Large-scale agriculture arrived in Jefferson County when 1,500 acres of rice was grown in 1892. Rice farmers from Louisiana poured across the border to buy up unused prairie lands for $3 an acre, that a year earlier were selling for $1 an acre. Rice production went from 100 acres in 1890 to 78,000 acres by 1908. By 1900, people could readily see that a potential profit of $10,000 could be realized from only an 80 acre crop. Often, a single year's profits paid for the land, bought seed, mules, and machinery for next year's crop, and left ample money to live on. By 1900, four rice mills were built in Jefferson County. Between 1898 and 1906, four rice canal companies built 200 miles of main canals in the county.

The rice market "went bust" from overproduction in 1906, and the Neches River south of Beaumont went salty after deep dredging, forcing southern Jefferson County canal systems into bankruptcy. Northern Jefferson County canal systems held their ground until the market returned. By about 1910, a different breed of farmer arrived in the county; one who experimented with other crops when one failed. Sugar cane was grown in the county and cane syrup and sugar were produced at five sugar mills in Port Neches and Nederland. In the 1920's, cotton was grown in the Amelia area, north of U.S. Highway 90, and Figs were grown south of U.S. Highway 90 in the same area. Fig production and canning plants became large, with perhaps 5,000 acres of trees in the vicinities of Amelia, Cheek, Hamshire, and Winnie. Many fig growers, however, went bankrupt from overproduction and the arrival of the great depression. Cotton production in north and west Jefferson County also ended with the effects of the great depression.

Jefferson County was home of the birth of the modern oil and petrochemical industry. Before 1900, almost all oil came from Pennsylvania and was used mainly for lubrication. With the invention of the internal combustion engine in the late 1800's, oil could be refined into kerosene, and motor fuels such as gasoline. Oil wells in Pennsylvania, however, produced low volumes of oil. A local resident of Jefferson County, Patillo Higgins, was convinced that there was oil under a salt dome south of Beaumont. After several attempts were made at drilling for oil on the salt dome, an oil gusher was struck on January 10, 1901. Known as the "Lucas Gusher," named after the person who commanded the drilling of the well, the well on "Spindletop" salt dome spewed forth over 100,000 barrels of oil per day. This awesome production of oil from one well caused immense interest across the United States, and created a boomtown in the nearby town of Beaumont. The sleepy town of 9,000 swelled in population to over 50,000 in a matter of days. Many oil wells were drilled in the vicinity of the "Lucas Gusher" and they produced high volumes of oil.

By about 1908, the oil production decreased dramatically in the area and the oil boom was over. But as a result of the oil discovery, many new oil-related industries were developed in Jefferson County, and they employ a large portion of the local population even today. (9)

History and Development of Orange County, Texas

Prior to the discovery and settlement of Orange County by European settlers, the Karankawas, and later, the Atakapas Indians lived in the area. The Atakapas Indians invaded Southeast Texas from Central Louisiana about 1600, displacing the much taller Karankawa warriors. (9)

In the 1700's, the area that is now Orange County was claimed by both France and Spain. After the Louisiana Purchase of 1803, the United States and Spain forged a Neutral Ground Agreement. This agreement provided for a neutral buffer strip ("no man's land") that ran from the Sabine River to just east of present-day Lake Charles. This buffer strip and the surrounding area became a breeding ground of lawlessness, misfits, and outcasts. This had an influential impact on the nature of the people that moved to Orange County in the 1800's. (19)

At the Texas Consultation of San Felipe in November, 1835, the "Municipality of Jefferson" was created. This "Municipality," strangely enough, bore the exact geographic confines of what later became Orange County. In 1837, Jefferson County was created, and included the area of present-day Orange County. Orange County separated from Jefferson County on February 5, 1852. There are at least three versions of the way in which Orange County got its name. One tradition holds that the name came from a citrus grove owned by George A. Patillo. Another maintains that it was named for "a large grove of native orange trees that once grew in the vicinity." Probably, the most likely version is that Orange County was named after Orange, New Jersey, the hometown of A. H. Reading, one of three commissioners authorized to organize the county in 1852. (19)

Settlers who came to Orange County quickly realized that the land was suitable for raising cattle and growing rice. The Opelousas Trail was a favored cattle trail that ran from west to east, and traversed Orange County. Until the early 1900's, cattle were economically more important than rice. By 1850, 40,000 head of cattle were driven annually across Orange County on the Opelousas Trail.

The area around the present-day city of Orange was first settled and named "Green's Bluff" by Reason Green in 1836. Green and his family lived there about three years and departed. The site then became known as "Strong's Bluff" and "Pine Bluff." By 1840, a town called Huntley was being built on the site. Huntley became known as "Lower town of Jefferson" and "East Jefferson" before 1842. In 1842, the Congress of the Republic of Texas changed the name of the town to "Madison." Madison was incorporated in 1856. Citizens of Madison, fearing confusion of the town's name with the town of Madisonville, Texas, asked the Texas Legislature to change the name. The name of Orange was officially recognized by the Texas Legislature on February 6, 1858. (19)

The Sabine River and Sabine Lake opened for navigation in 1837. As a result, cotton trade and transportation became lucrative. The Agricultural Census of the time reported over 70,000 bales of cotton being produced in eleven counties along the middle and lower Sabine River. Many steamboats began running the Sabine River from Orange to Logansport in the mid 1800's, transporting cotton and other goods. About the same time that the Sabine River opened for navigation, the lumber industry got started in Orange County. There was prime cypress timber in the Neches and Sabine River bottoms, and along major bayous. In 1835 and 1836, Robert E. Boothe built a water mill along Adam's Bayou. The lumber that was produced by the mill was traded for rum, tobacco, gunpowder, and dry goods. A steam powered sawmill was built on the Sabine River north of present-day Orange in 1841. The mill was built using parts of a wrecked steamboat. Bald cypress was harvested and used for lumber at first. In 1876, lumbermen Henry Jacob Lutcher and G. Bedell Moore came to Orange County and saw the yellow pine trees of the area as being good for lumber. They invested heavily in the timberlands of the area, and inflated land prices greatly. As a result, many new sawmills were built in the area. Fires and high timber costs caused the closing of many sawmills in Orange County just before 1900. (19)

Rice culture in Orange County began in earnest in 1889, when a farmer built a canal off Cow Bayou and successfully produced 200 acres of rice. Other canals were then built and Orange County became a rice center. Many rice farmers flocked in to the county from Louisiana and grew rice. Rice has remained profitable in Orange County, but recently, rice production has been on the decrease.

Transportation in Orange County, prior to 1900, was primitive at best. The roads were few and far between, and there were no bridges. A few ferries ran on the Neches and Sabine Rivers and on bayou crossings. A railroad was built from Houston to Orange in 1861. Because of the Civil War, the 20 miles of track between Beaumont and Orange was removed to provide timber for the fort at Sabine Pass, site of an important Confederate victory in 1863. Rail service was completed to Orange in 1876. In 1924, the first highway bridge into Orange County was completed over the Neches River at Beaumont. U.S. Highway 90 was completed through Orange County in the early 1930's. The Sabine River Bridge was opened in Orange in 1927.

The oil industry in Orange County began in 1913, when the "Bland Well," drilled in the small town of Orangefield, began gushing oil. After 1913, other significant oil finds in Orange County were not made until 1922, when the "Oscar Chesson Well" was drilled. This oil gusher created a boom for the nearby town of Orange. The population of Orange doubled in a few days, from 10,000 to over 20,000 people. This oil discovery prompted other drilling as a major oil field developed. The oilfield, however, caught fire in 1923 and much of the oil production was lost. As a result of the oil discoveries in the region, many refineries and petrochemical industries were developed, and still remain today.

The city of Orange became a major shipbuilding center, almost from the time of its incorporation. In the nineteenth and into the twentieth century, there was an abundance of lumber in the area. River navigation made sailing ships possible. As a result, the shipbuilding industry quickly grew. Orange shipbuilding peaked during the first and second world wars, when the shipyards built tugboats, minesweepers, destroyers, and landing craft for the U.S. Navy. Orange shipbuilders used mostly wood to build ships until the 1930's, when the shipbuilders found steel to be economical as a building material. (19)

Agriculture

The production of timber is the primary agricultural enterprise of the Western Gulf Coast Flatwoods MLRA. The production of livestock, hay, and rice are the major enterprises of the Gulf Coast Prairies MLRA. The major agricultural enterprise of the Gulf Coast Marsh is the improvement or maintenance of wildlife habitat used for hunting or fishing. The market value of agricultural activities is about 28 million dollars for the area. (13)

Natural Resources

The most important natural resources in Hardin County are soil, water, wildlife, petroleum, timber, and natural gas. Soil is critical for the production of crops, hay, livestock, and timber, which are main sources of income in the county. Sand mined along the terraces of the Neches and Sabine Rivers from the uplands are mainly used for road and building construction.

Extensive amounts of timber are found in the northern part of Orange County throughout and represent the largest source of income for the county.

Water is abundant in the numerous small lakes, ponds, creeks, and rivers in the county. The high rainfall that is evenly distributed throughout the year provides ample supply of water for most domestic uses.

Oil and gas is produced in nearly all parts of the county. The leases for oil and gas production have provided the county and its landowners a source of added income.

Climate

Prepared by the Natural Resources Conservation Service National Water and Climate Center, Portland, Oregon.

Table 1 shows data on temperature and precipitation for the survey area as recorded at Port Arthur, Texas, in the period 1971 to 2000. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on the length of the growing season.

In winter, the average temperature is 55 degrees F and the average daily minimum temperature is 44 degrees. The lowest temperature on record, which occurred on December 23, 1989, is 12 degrees. In summer, the average temperature is 82 degrees and the average daily maximum temperature is 91 degrees. The highest temperature, which occurred on August 31, 2000, is 108 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 average annual total precipitation is about 60 inches. Of this, about 49 inches, or 82 percent, usually falls in February through November. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 2.1 inches on September 17, 1963. Thunderstorms occur on about 67 days each year, and most occur in July and August.

The average seasonal snowfall is 0.2 inches. The greatest snow depth at any one time during the period of record was 4 inches recorded on February 13, 1960. The heaviest 1-day snowfall on record was 3.5 inches recorded on February 12, 1960.

The average relative humidity in mid-afternoon is about 72 percent. Humidity is higher at night, and the average at dawn is about 91 percent. The sun shines 66 percent of the time in summer and 47 percent in winter. The prevailing wind is from the South. Average wind speed is highest, 12 miles per hour, in April.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; and the kinds of crops. 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 and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept or model of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area 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-vegetation-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, 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. Soil taxonomy, 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 and 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 predict 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.

The descriptions, names, and delineations of the soils in this survey area do not fully agree with those of the soils in adjacent survey areas. Differences are the result of a better knowledge of soils, modifications in series concepts, or variations in the intensity of mapping or in the extent of the soils in the survey area.

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General Soil Map Units

The general soil map in 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 or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The components of one map 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.

1. League-Beaumont-China

Location in the survey area: Mainly throughout most of Jefferson County (fig. 2).
Landscape position: Upland prairies
Slope: 0 to 1 percent slopes

Composition

Percent of the survey area: 20 percent
League soils: 34 percent
Beaumont soils: 28 percent
China soils: 7 percent
Minor soils: 31 percent (including Estes, Labelle, Morey, and Vamont)

Soil Characteristics

League

Surface layer:
0 to 6 inches; very strongly acid, dark gray clay with brown mottles
Subsurface layer:
6 to 11 inches; very strongly acid, very dark gray clay with brown mottles
Subsoil:
11 to 30 inches; very strongly acid, very dark gray clay with brown mottles
30 to 36 inches; very strongly acid, dark gray clay with brown mottles
36 to 46 inches; strongly acid, gray clay with gray and brown mottles
46 to 59 inches; slightly acid, light gray clay with yellow mottles
59 to 80 inches; neutral, light gray clay with yellow and brown mottles
Drainage class: Somewhat poorly drained
Seasonal high water table: A water table occurs at a depth of 0.8 inches to 1 foot below the surface from January through March

Beaumont

Surface layer:
0 to 5 inches; extremely acid, dark gray clay with red mottles

Figure 2.—Rice production on Beaumont clay, 0 to 1 percent slopes. The lines in the background are levees, used to control flooding.

Subsurface layer:
5 to 9 inches; very strongly acid, dark gray clay with red mottles
Subsoil:
9 to 19 inches; very strongly acid, gray clay with red and brown mottles
19 to 80 inches; very strongly acid, gray to light gray clay with red and yellow mottles
Drainage class: Poorly drained
Seasonal high water table: A perched water occurs at a depth of 0.5 to 1 foot from November through March

China

Surface layer:
0 to 4 inches; very strongly acid, very dark gray clay
Subsurface layer:
4 to 28 inches; very strongly acid, very dark gray clay with red mottles
Subsoil:
28 to 55 inches; very strongly acid, dark gray clay with brown and red mottles
55 to 60 inches; strongly acid, gray clay with red and brown mottles
60 to 80 inches; strongly acid, gray clay with red and yellow mottles
Drainage class: Somewhat poorly drained
Seasonal high water table: Not present within 80 inches

Use and Management

This unit is used as cropland, pasture, and rangeland. Rice and soybeans are the main crops grown. This soil is widely used for rice production because it has very little slope, it is very slowly permeable, and requires little mechanical leveling.

Crops grown on this soil are responsive to good management. This soil is sticky when wet, hard when dry, and can become cloddy when plowed. A good fertility program is needed for consistent high production.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality.

Native range grasses, when properly managed, are capable of producing high yields on this soil. Soil wetness, caused by very low surface runoff and a seasonal high water table, is a concern.

Most urban uses are affected by soil properties. Soil wetness caused by very low surface runoff and a seasonal high water table, is a concern. The clayey texture of the soil also requires special modifications and proper installation procedures, so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets.

2. Labelle-Morey-Meaton

Location in the survey area: Mainly throughout Jefferson County
Landscape position: Upland prairies
Slope: 0 to 1 percent slopes

Composition

Percent of the survey area: 18 percent
Labelle soils: 38 percent
Morey soils: 12 percent
Meaton soils: 14 percent and the similar Viterbo soil
Minor soils: 36 percent (including Beaumont, Leton, and Viterbo)

Soil Characteristics

Labelle

Surface layer:
0 to 6 inches; slightly acid, dark grayish brown silty clay loam with brown mottles
Subsoil:
6 to 12 inches; neutral, black silty clay loam with brown mottles
12 to 30 inches; neutral, very dark and dark gray clay with brown mottles
30 to 50 inches; slightly alkaline, gray silty clay with brown mottles
50 to 80 inches; slightly alkaline, gray silty clay with brown mottles
Drainage class: Somewhat poorly drained
Seasonal high water table: A perched water table occurs at a depth of 0.5 to 1.5 feet from January through March

Morey

Surface layer:
0 to 5 inches; neutral, very dark gray loam
Subsoil:
5 to 9 inches; neutral, very dark gray loam with brown mottles
9 to 26 inches; slightly alkaline; very dark gray clay loam with brown mottles
26 to 49 inches; moderately alkaline, dark gray clay loam with yellow and brown mottles
49 to 55 inches; moderately alkaline, grayish brown and gray clay loam
55 to 80 inches; moderately alkaline, light brownish gray clay loam with yellow mottles

Drainage class: Somewhat poorly drained
Seasonal high water table: A perched water table occurs at a depth of 2 to 2.5 feet from December through February

Meaton

Surface layer:
0 to 12 inches; moderately acid, very dark gray silt loam with brown mottles
Subsoil:
12 to 22 inches; moderately acid, very dark gray silty clay loam with gray and brown mottles
22 to 37 inches; neutral, dark and gray silty clay loam with gray and brown mottles
37 to 80 inches; slightly alkaline, light gray and light brownish gray silty clay loam and silty clay with yellow, brown, and gray mottles
Drainage class: Somewhat poorly drained
Seasonal high water table: A perched water table occurs at a depth of 1 to 1.5 feet from January through March

Use and Management

This unit is used mainly as cropland and pasture. This soil is used for rice production because it does not have much slope, it is very slowly permeable, and does not require much mechanical leveling.

Crops grown on this soil are responsive to good management. This soil is sticky when wet, hard when dry, and can become cloddy when plowed. The structure and tilth can be adversely affected when it is tilled too wet or too dry. Drainage systems that include proper row direction and field drains with adequate outlets are needed to remove excess surface water after rains. A good fertility program is needed for consistent high production.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality.

Native range grasses, when properly managed, are capable of producing high yields on this soil. The major concern is soil wetness, both from water standing on the surface after rains and a seasonal high water table.

Most urban uses are affected by soil properties. Soil wetness, caused by very low surface runoff and a seasonal high water table, is a concern. The clayey texture of the soil also requires special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets.

3. Leerco-Zummo-Caplen

Location in the survey area: Southeastern part of the survey parallel to the Gulf of Mexico
Landscape position: Coastal marsh
Slope: 0 to 1 percent slopes

Composition

Percent of the survey area: 13 percent
Leerco and the similar Barnett soils: 37 percent
Zummo and the similar Harris soils: 22 percent
Caplen soils: 14 percent
Minor soils: 27 percent (including Franeau, Ijam, Larose, and Neches)

Soil Characteristics

Leerco

Surface layer:
0 to 5 inches; moderately acid, very slightly saline, black muck
Subsurface layer:
5 to 14 inches; moderately acid, slightly saline, very dark gray mucky clay
14 to 26 inches; moderately acid, slightly saline, gray fluid clay with gray and brown mottles
26 to 34 inches; strongly acid, moderately saline, gray fluid clay with gray and brown mottles
34 to 80 inches; moderately acid, moderately saline, gray fluid clay with gray mottles
Drainage class: Very poorly drained
Seasonal high water table: A water table occurs from the surface to more than 6 feet throughout the year

Zummo

Surface layer:
0 to 8 inches; strongly acid, very dark gray muck
Underlying material:
8 to 16 inches; very strongly acid, black clay
16 to 24 inches; strongly acid, very dark gray clay with gray mottles
24 to 34 inches; slightly acid, dark gray clay with yellow and gray mottles
34 to 46 inches; slightly acid, gray clay with gray and yellow mottles
46 to 80 inches; neutral, light gray to gray with yellow and gray mottles
Drainage class: Very poorly drained
Seasonal high water table: A water table occurs from the surface to more than 6 feet throughout the year

Caplen

Surface layer:
0 to 12 inches; slightly acid, very slightly saline, very dark gray mucky peat
Subsurface layer:
12 to 37 inches; slightly acid, very slightly saline, very dark gray mucky clay to clay with brown mottles in the lower part
37 to 58 inches; neutral, slightly saline, dark gray fluid clay
58 to 80 inches; neutral to slightly acid, slightly saline, light gray and dark gray fluid clay with brown or black mottles
Drainage class: Very poorly drained
Seasonal high water table: A water table occurs from the surface to a depth of more than 6 feet throughout the year

Use and Management

This unit is mainly used as habitat for wildlife. It is not suited to crop production, pasture, rangeland, or forestland because of salinity, flooding, tidal inundation, and wetness. Some of the soils are too soft to support the weight of livestock.

This soil is capable of producing high yields of marsh range grasses when properly managed. Proper management on this soil includes practices that prevent the highly organic soil surface from burning, maintaining the delicate plant community, and maintaining plant vigor.

Most urban uses are affected by soil properties and various wetland related laws. Flooding and long periods of wetness does not allow septic systems to function properly without extensive modifications. In addition, the low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets.

4. Texla-Evadale

Location in the survey area: Largely in the northern third of Orange County
Landscape position: Forested uplands
Slope: 0 to 1 percent slopes

Composition

Percent of the survey area: 9 percent
Texla soils: 50 percent
Evadale soils: 25 percent
Minor soils: 25 percent (including Bleakwood, Camptown, Gist, and Orcadia)

Soil Characteristics

Texla

Surface layer:
0 to 3 inches; very strongly acid, grayish brown silt loam with gray mottles
Subsurface layer:
3 to 8 inches; very strongly acid, light brownish gray silt loam with brown and yellow mottles
8 to 13 inches; extremely acid, light brownish gray silt loam with brown mottles
13 to 21 inches; extremely acid, light brownish gray silt loam and silty clay loam with brown and red mottles
Subsoil:
21 to 28 inches; light brownish gray silty clay and gray and pale brown silt loam with brown and red mottles
28 to 58 inches; light brownish gray silty clay and light gray silt loam with brown, red, and yellow mottles
58 to 80 inches; light gray silty clay and light gray silt loam with yellow, brown, and red mottles
Drainage class: Somewhat poorly drained
Seasonal high water table: A perched water table occurs at a depth of 0.5 to 1.5 feet January through March

Evadale

Surface layer:
0 to 5 inches; very strongly acid, dark grayish brown silt loam
Subsurface layer:
5 to 9 inches; very strongly acid, light brownish gray silt with brown mottles
Subsoil:
9 to 14 inches; extremely acid, grayish brown silt loam with dark grayish brown silty clay loam and brown mottles
14 to 22 inches; very strongly acid, grayish brown silt loam with light grayish brown silty clay loam with brown and yellow mottles
22 to 34 inches; very strongly acid, silty clay with light brownish gray silt loam and yellow, brown, and gray mottles
34 to 46 inches; very strongly acid, grayish brown silty clay with yellow and brown mottles
46 to 55 inches; very strongly acid, light brownish gray silty clay with yellow mottles
55 to 80 inches; strongly acid, gray silty clay with brown and gray mottles
Drainage class: Poorly drained

Seasonal high water table: A perched water table may exist at the surface to a depth of 1.5 feet from December through April

Use and Management

This unit is used mainly as woodland and native pasture. Some areas are cropped to rice.

Woodland areas consist of pine and hardwood. The main commercial tree used for timber production is loblolly pine. Wetness is the most limiting feature of this soil for production and harvesting of timber. The seasonal high water table restricts the use of equipment to midsummer when the soil is dry. The seasonal high water table restricts root development. Woodland practices such as selective thinning and removal of undesirable trees should be carried out to maximize production.

Crops grown on this soil are responsive to good management. Drainage systems that include proper row direction and field drains with adequate outlets are needed to remove excess surface water after rains. A good fertility program is needed for consistent high production.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality.

Most urban uses are affected by soil properties. Soil wetness, caused by low surface runoff and a seasonal high water table, is a concern. The texture in the lower part of the soil also requires special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets.

5. Orcadia-Aris

Location in the survey area: Mainly in the middle third of Orange County
Landscape position: Upland prairies
Slope: 0 to 2 percent slopes

Composition

Percent of the survey area: 8 percent
Orcadia soils: 60 percent
Aris soils: 15 percent
Minor soils: 25 percent (including Anahuac, Bevil, Bleakwood, Labelle, and Fausse)

Soil Characteristics

Orcadia

Surface layer:
0 to 5 inches; very strongly acid, very dark grayish brown silt loam
Subsurface layer:
5 to 10 inches; strongly acid, dark brown loam
Subsoil:
10 to 15 inches; very strongly acid, dark grayish brown silty clay loam and light brownish gray silt loam with brown mottles
15 to 45 inches; very strongly acid, dark gray to gray clay with red mottles
45 to 59 inches; strongly acid, gray clay with red and yellow mottles
59 to 70 inches; strongly acid, light brownish gray clay with red and yellow mottles
70 to 80 inches; very strongly acid, light brownish gray clay with brown and gray mottles

Drainage class: Somewhat poorly drained
Seasonal high water table: A perched water table occurs at a depth of 0.8 inches to 1.5 feet from January through March

Aris

Surface layer:
0 to 6 inches; very strongly acid, dark grayish brown silt loam
Subsurface layer:
6 to 14 inches; very strongly acid, light brownish gray silty clay loam with grayish brown silty clay loam with brown and gray mottles
Subsoil:
14 to 23 inches; very strongly acid, dark gray silty clay with light brownish gray silt loam and brown and gray mottles
23 to 30 inches; strongly acid, gray clay with brown, red, and gray mottles
30 to 51 inches; moderately acid, light brownish gray clay with gray, brown, red mottles
51 to 72 inches; slightly acid, light gray clay with brown and yellow mottles
72 to 80 inches; neutral, light gray clay with yellow and brown mottles
Drainage class: Poorly drained
Seasonal high water table: A water table occurs from the surface to a depth of 2 feet from November to March

Use and Management

This unit is used mainly as pasture. A few areas are in rangeland and cropland.

Crops grown on this complex are responsive to good management. The major concerns are the nonuniform slope of many of the soils unless they have been leveled previously. Many areas remain wet for extended periods of time following rains. These soils are slightly sticky when wet, hard when dry, and can become cloddy when plowed. Favorable soil structure and tilth can be maintained or improved by incorporating crop residue in the surface layer and tilling at the correct moisture content. Drainage systems that are well planned are usually needed to remove excess surface water from the Aris areas after rains. A good fertility program is needed for consistent high production.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality.

Native range grasses, when properly managed, are capable of producing medium yields on this unit. Good management that includes establishment and maintenance of good plant vigor and growth in the Aris areas increases the overall production of this soil unit. Soil wetness, caused by very slow to ponded surface runoff, is a concern.

Most urban uses are affected by soil properties. The clayey subsoils and the wetness require special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete will reduce corrosion concerns.

6. Bancker-Creole-Veston

Location in the survey area: Lower parts of the coastal area in the survey area
Landscape position: Coastal marsh
Slope: 0 to 1 percent slopes

Composition

Percent of the survey area: 6 percent
Bancker soils: 36 percent
Creole soils: 26 percent
Veston soils: 9 percent
Minor soils: 29 percent (including Barnett, Beaches, Ijam, Sabine, and Scatlake)

Soil Characteristics

Bancker

Surface layer:
0 to 9 inches; slightly acid, moderately saline, very fluid gray mucky peat
Underlying material:
9 to 41 inches; neutral, strongly saline, very fluid gray clay
41 to 80 inches; slightly acid, extremely saline, very fluid gray clay
Drainage class: Very poorly drained
Seasonal high water table: An apparent water table extends from the surface to more than 6 feet throughout the year

Creole

Surface layer:
0 to 7 inches; medium acid, moderately saline, gray very fluid mucky peat
Subsurface layer:
7 to 13 inches; slightly acid, moderately saline, gray fluid clay
Underlying material:
13 to 80 inches; neutral, moderately saline grading to strongly saline, gray to dark gray very fluid to fluid clay
Drainage class: Very poorly drained
Seasonal high water table: A water table occurs from the surface to a depth of more than 6 feet throughout the year

Veston

Surface layer:
0 to 3 inches; moderately alkaline, moderately saline, very dark gray loamy very fine sand
Subsurface layer:
3 to 5 inches; moderately alkaline, strongly saline, grayish brown loamy very fine sand with gray, yellow and brown mottles
5 to 8 inches; moderately alkaline, strongly saline, dark gray very fine sandy loam with gray and brown mottles
Subsoil:
8 to 16 inches; moderately alkaline, strongly saline, gray loamy very fine sand with gray and brown mottles
16 to 26 inches; moderately alkaline, strongly saline, gray very fine sandy loam with gray and brown mottles
26 to 38 inches; moderately alkaline, strongly saline, black clay loam with brown mottles
38 to 51 inches; moderately alkaline, strongly saline, gray loam with olive mottles
51 to 60 inches; moderately alkaline, strongly saline, light gray and gray loam with yellow mottles
60 to 75 inches; moderately alkaline, strongly saline, white clay loam with yellow mottles
75 to 80 inches; moderately alkaline, strongly saline, white clay loam with gray and yellow mottles

Drainage class: Poorly drained
Seasonal high water table: A water table occurs at the surface to a depth of 2 feet throughout the year

Use and Management

This unit is mainly used as habitat for wildlife. It is not suited to crop production, pasture, rangeland, or forestland because of salinity, flooding, tidal inundation, and wetness. Some of the soils are too soft to support the weight of livestock.

This soil is capable of producing high yields of marsh range grasses when properly managed. Proper management on this soil includes practices that prevent the highly organic soil surface from burning, maintaining the delicate plant community, and maintaining plant vigor.

Most urban uses are affected by soil properties and various wetland related laws. Flooding and long periods of wetness does not allow septic systems to function properly without extensive modifications. In addition, the low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets.

7. Anahuac-Aris-Leton

Location in the survey area: Mainly in narrow areas in the middle half of Jefferson County
Landscape position: Upland prairie
Slope: 0 to 2 percent slopes

Composition

Percent of the survey area: 5 percent
Anahuac soils: 48 percent
Aris soils: 14 percent
Leton soils: 7 percent
Minor soils: 31 percent (including Labelle, Morey, and Veston)

Soil Characteristics

Anahuac

Surface layer:
0 to 7 inches; very strongly acid, very dark grayish brown very fine sandy loam
Subsurface layer:
7 to 14 inches; strongly acid, dark brown loam
14 to 18 inches; very strongly acid, brown loam
Subsoil:
18 to 22 inches; very strongly acid, grayish brown and yellowish brown loam with brown mottles
22 to 33 inches; very strongly acid, dark gray clay with red mottles
33 to 41 inches; strongly acid, dark gray clay with red and brown mottles
41 to 54 inches; strongly acid, light brownish gray clay loam with yellow and red mottles
Underlying material:
54 to 63 inches; moderately acid, light brownish gray loam with brown, red, and yellow mottles
63 to 80 inches; slightly acid, light gray loam with yellow, gray, and brown mottles
Drainage class: Moderately well drained
Seasonal high water table: A perched water table occurs at a depth of 16 to 24 inches from November to March. An apparent water table exists from a depth of 4 feet to more than 6 feet from November through April.

Aris

Surface layer:
0 to 6 inches; very strongly acid, dark grayish brown silt loam
Subsurface layer:
6 to 14 inches; very strongly acid, light brownish gray silty clay loam with grayish brown silty clay loam with brown and gray mottles
Subsoil:
14 to 23 inches; very strongly acid, dark gray silty clay with light brownish gray silt loam with brown and gray mottles
23 to 30 inches; strongly acid, gray clay with brown, red, and gray mottles
30 to 51 inches; moderately acid, light brownish gray clay with gray, brown, red mottles
51 to 72 inches; slightly acid, light gray clay with brown and yellow mottles
72 to 80 inches; neutral, light gray clay with yellow and brown mottles
Drainage class: Poorly drained
Seasonal high water table: A water table occurs from the surface to a depth of 2 feet from November to March

Leton

Surface layer:
0 to 4 inches; extremely acid, dark grayish brown silt loam
Subsurface layer:
4 to 8 inches; extremely acid, dark gray silt loam
8 to 20 inches; ultra acid, dark gray silt loam with gray mottles
Subsoil:
20 to 34 inches; ultra acid, gray silty clay loam with gray mottles
34 to 80 inches; extremely acid, light gray silty clay loam with brown and gray mottles
Drainage class: Poorly drained
Seasonal high water table: A water table occurs at the surface to a depth of 1.5 feet from October through May

Use and Management

This unit is used mainly as cropland and pasture.

Crops grown on this soil are responsive to good management. Some soils are somewhat sticky when wet, hard when dry, and can become cloddy when plowed. The structure and tilth can be adversely affected when it is tilled too wet or too dry. Drainage systems that include proper row direction and field drains with adequate outlets are needed to remove excess surface water after rains. A good fertility program is needed for consistent high production. Generally rice is not grown because the slope is not uniform and level.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality.

Native range grasses, when properly managed, are capable of producing high yields on this soil. The major concern is soil wetness of some of the soils, both from water standing on the surface after rains and a seasonal high water table.

Most urban uses are affected by soil properties. Soil wetness, caused by very low surface runoff and a seasonal high water table, is a concern. The clayey texture of the soil also requires special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets.

8. Ijam-Neel-Neches

Location in the survey area: Mainly in the eastern part of the survey adjacent to the Intracoastal Waterway, Sabine Lake, and the Neches River
Landscape position: Spoil banks adjacent to the coastal marsh
Slope: 0 to 5 percent slopes

Composition

Percent of the survey area: 5 percent
Ijam soils: 25 percent
Neel soils: 20 percent
Neches soils: 10 percent
Minor soils: 45 percent (including Bancker, Creole, and Veston)

Ijam

Surface layer:
0 to 6 inches; very strongly acid, dark gray clay
Underlying material:
6 to 23 inches; neutral, slightly saline, light brownish gray clay with brown mottles
23 to 65 inches; neutral, moderately saline, yellowish brown and light brownish gray clay with yellow and brown mottles
65 to 80 inches; neutral, moderately saline, light gray clay with yellow mottles
Drainage class: Poorly drained
Seasonal high water table: A water table occurs at the surface to a depth of 3.0 feet from September through June

Neel

Surface layer:
0 to 12 inches; neutral, light brownish gray clay with brown, olive, gray, and brown mottles
Underlying material:
12 to 80 inches: slightly alkaline, slightly to moderately saline, gray to light gray clay with brown, olive, gray, and brown mottles
Drainage class: Moderately well drained
Seasonal high water table: A water table occurs at a depth of 3.0 to 6.0 feet from September through May

Neches

Surface layer:
0 to 5 inches; slightly acid, brown coarse sand
Underlying material:
5 to 18 inches; slightly acid, brown coarse sand with gray and brown clayey mottles
18 to 36 inches; neutral, yellowish brown coarse sand with brown mottles and gray clayey strata
36 to 41 inches; neutral, pale brown clay with red mottles and brown sandy strata
41 to 45 inches; neutral, gray clay with red mottles and gray clay strata
45 to 54 inches; neutral, pale brown coarse sand with red mottles and gray clay strata
54 to 80 inches; neutral, light brownish gray clay with brown coarse sand strata
Drainage class: Well drained
Seasonal high water table: Not present within 80 inches

Use and Management

It is mainly used as rangeland and urban related land. Many areas are still used as dredge spoil areas.

Most areas are not suited to crop production, pasture, or woodland because of salinity and flooding. These areas are variable in appearance depending on how long the dredging operation has taken place. After the deposition of the dredge material, the soil is typically very boggy and saline and some areas may be covered with water for some time. With time, the area becomes firm and less saline. The initial vegetation will be somewhat variable depending on the position, salinity, and water table.

This soil is capable of producing high yields of range grasses when properly managed. Management may be difficult until these areas become stable with vegetation. These areas are often utilized extensively by livestock as bedding areas and refuge from floods and storms because they are drier and at a higher elevation than other marshes. As a result, these areas are often overgrazed and difficult to manage. Plant vigor can be maintained by proper stocking and by using a grazing rotation system. Prescribed burning also can be effectively used to help maintain plant vigor. Proper location of freshwater facilities and bedding areas for cattle also helps achieve proper grazing.

Most urban uses are affected by soil properties. Clayey texture, flooding, and wetness require special modifications and proper installation procedures so septic systems can function adequately in most areas. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets in most areas.

9. Estes-Fausse

Location in the survey area: Mainly the northeastern edge of Jefferson County and the northwestern and northeastern edge of Orange County
Landscape position: Flood plains
Slope: 0 to 1 percent slopes

Composition

Percent of the survey area: 2 percent
Estes soils: 36 percent
Fausse soils: 32 percent
Minor soils: 32 percent (including Barbary, Beaumont, Ijam, Labelle, Spurger, and Viterbo)

Estes

Surface layer:
0 to 4 inches; very strongly acid, brown clay
Subsoil:
4 to 11 inches; very strongly acid, strong brown clay with gray mottles
11 to 23 inches; very strongly acid, light brownish gray clay with brown mottles
23 to 80 inches; strongly acid, light brownish gray clay with red and brown mottles
Drainage class: Somewhat poorly drained
Seasonal high water table: A perched water table occurs at the surface to a depth of 1.5 feet from November through May

Fausse

Surface layer:
0 to 6 inches; strongly acid, gray clay
Subsurface layer:
6 to 14 inches; strongly acid, gray clay with olive mottles
14 to 26 inches; extremely acid, light gray clay with yellow mottles
26 to 55 inches; extremely acid, gray clay with yellow mottles
55 to 68 inches; extremely acid, light gray clay with yellow and brown mottles
68 to 80 inches; very strongly acid, gray clay
Drainage class: Very poorly drained
Seasonal high water table: A water table occurs from the surface to depth of more than 6 feet throughout the year

Use and Management

This unit is mainly used as woodland, cropland and native pasture. Rice is the main crop grown.

Woodland areas consist mainly of a mixed oak forest. Commercial trees used for timber production are water oak and sweetgum. Wetness and flooding are the most limiting feature of this soil for production and harvesting of timber. The seasonal high water table restricts the use of equipment for much of the year. Seedling survival of some species is affected in those years following extended wet periods. The seasonal high water table restricts root development. Trees occasionally are subject to windthrow during periods when the soil is wet. Using standard equipment with wheels or tracks on this soil causes rutting and compaction when the soil is wet. Woodland practices such as selective thinning and removal of undesirable trees should be carried out to maximize production.

Pasture on this soil is responsive to good management. Adapted pasture grasses include bahiagrass, dallisgrass, and tall fescue. A grazing management system, proper use of fertilizer and lime, and a drainage system increases forage yields and improves quality. Wetness in the soil profile and flooding limits the use of some equipment, affects grass production, and affects grazing in some parts of most years. Proper use of fertilizer and lime, controlled grazing, and surface drainage improve yields while protecting the soil from erosion. This soil has low inherent fertility.

Most urban uses are affected by soil properties. Wetness, flooding, and clayey texture of the soil require special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets.

10. Craigen-Mollco

Location in the survey area: Isolated area in the upper third of both counties
Landscape position: Forested uplands
Slope: 0 to 2 percent slopes

Composition

Percent of the survey area: 2 percent
Craigen soils: 55 percent
Mollco soils: 25 percent
Minor soils: 20 percent (including Evadale, Labelle, and Texla)

Soil Characteristics

Craigen

Surface layer:
0 to 7 inches; extremely acid, dark grayish brown loamy fine sand
Subsurface layer:
7 to 32 inches; extremely acid, pale brown to strong brown loamy fine sand with brown and yellow mottles
Subsoil:
32 to 37 inches; extremely acid, pale brown and strong brown fine sandy loam with light brownish gray albic material
37 to 49 inches; very strongly acid, yellowish brown and strong brown sandy clay loam with light brownish gray albic material and gray mottles
49 to 60 inches; very strongly acid, yellowish red fine sandy loam with light brownish gray albic material and brown mottles
60 to 72 inches; very strongly acid, gray fine sandy loam with brown mottles
72 to 80 inches; very strongly acid, gray and dark gray fine sandy loam with brown mottles
Drainage class: Moderately well
Seasonal high water table: An apparent water table occurs at a depth of 3.0 to 5.0 feet from January to April

Mollco

Surface layer:
0 to 3 inches; very strongly acid, dark grayish brown fine sandy loam
Subsurface layer:
3 to 16 inches; extremely acid, gray fine sandy loam with brown mottles in the upper part
Subsoil:
16 to 22 inches; extremely acid, gray sandy clay loam with gray mottles
22 to 38 inches; extremely acid, greenish gray sandy clay loam with brown and gray mottles
38 to 80 inches; extremely acid, gray sandy clay loam with brown and gray mottles
Drainage class: Very poor
Seasonal high water table: A water table occurs from the surface to more than 6 feet from October through May

Use and Management

This unit is mainly used as woodland and pasture.

Woodland areas consist mainly of a mixed pine and oak forest. Commercial trees used for timber production are loblolly pine on the Craigen soil and water oak on the Mollco soil, which are the two main soils. Wetness of the Mollco soil is the most limiting feature of this soil for production and harvesting of timber. The seasonal high water table restricts the use of equipment for much of the year. Seedling survival of some species is affected in those years following extended wet periods. The seasonal high water table restricts root development. Puddling can occur during wet periods making unimproved roads and skid trails sticky, slick, and impassable. Woodland practices such as selective thinning and removal of undesirable trees should be carried out to maximize production.

Cropland on this complex is possible in some areas on the Craigen soil but it does not have as much natural fertility as other soils in the area.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality.

Most urban uses are affected by soil properties. The wetness of the Mollco soil requires special modifications and proper installation procedures so septic systems can function adequately. In addition, the high leaching potential and low strength of the Craigen soil must be compensated for in the design and construction of buildings, roads, and streets.

11. Camptown-Spurger-Bienville

Location in the survey area: In the northeastern edge of Jefferson County and the northwestern and northeastern part of Orange County
Landscape position: Forested uplands
Slope: 0 to 2 percent slopes

Composition

Percent of the survey area: 2 percent
Camptown soils: 26 percent
Spurger soils: 22 percent
Bienville soils: 17 percent
Minor soils: 35 percent (including Estes, Fausse, Labelle, and Vamont)

Soil Characteristics

Camptown

Surface layer:
0 to 5 inches; very strongly acid, dark gray silt loam with brown mottles
Subsurface layer:
5 to 8 inches; very strongly acid, gray silt loam with brown mottles
8 to 14 inches; very strongly acid, light gray silt loam and gray silty clay loam with red mottles
Subsoil:
14 to 35 inches; very strongly acid, gray silty clay loam with brown and gray mottles
35 to 40 inches; very strongly acid, dark gray silty clay loam and gray silt loam with brown mottles
40 to 80 inches; very strongly acid, dark gray silty clay with brown and red mottles
Drainage class: Very poorly drained
Seasonal high water table: A water table occurs from the surface to a depth more than 6 feet throughout the year

Spurger

Surface layer:
0 to 4 inches; strongly acid, dark grayish brown loam
Subsurface layer:
4 to 8 inches; strongly acid, brown loam with brown mottles
Subsoil:
8 to 16 inches; strongly acid, red clay with brown mottles
16 to 22 inches; strongly acid, reddish brown and reddish gray clay loam
22 to 40 inches; strongly acid, light brownish gray clay
40 to 50 inches; strongly acid, pale brown, light brownish gray, very pale brown, and strong brown clay

Underlying material:
50 to 80 inches; strongly acid, pale brown sandy clay loam, light brownish gray loamy fine sand, brownish yellow fine sandy loam, and yellowish red fine sandy loam
Drainage class: Moderately well drained
Seasonal high water table: A water table occurs at a depth of 5.0 to 6.0 feet from December through February

Bienville

Surface layer:
0 to 14 inches; moderately acid, brown loamy fine sand
Subsurface layer:
14 to 27 inches; strongly acid, strong brown and light brown loamy fine sand with brown mottles
Subsoil:
27 to 62 inches; strongly acid, light brown loamy fine sand
62 to 80 inches; strongly acid, pink loamy fine sand and fine sandy loam
Drainage class: Somewhat excessive
Seasonal high water table: A water table occurs at a depth of 4.0 to 6.0 feet from December through April

Use and Management

This unit is mainly used as woodland and pasture.

Woodland areas consist mainly of a mixed pine and oak forest. This unit includes wet Camptown soils to dry sandy Bienville soils. The Camptown soils are not suited to commercial production of timber because of wetness. Bienville soils are very productive for pine. Commercial trees used for timber production are loblolly pine, longleaf pine, and shortleaf pine on the Bienville soil. Therefore, wetness is a major concern for Camptown soils; whereas, seasonal wetness is a concern on the somewhat excessively drained Bienville soils. Woodland practices such as selective thinning and removal of undesirable trees should be carried out to maximize production.

Cropland on this complex needs intensive management for efficient production in areas where the soils are suitable. The major concern is the uneven surface topography, slope, and wetness in some areas. These soils also have less natural fertility than other commonly used cropland areas in the survey area. This unit typically needs a liming program to increase the pH of the upper part of the soil for good production. A good fertility program is needed for consistent high production.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass in areas that are not poorly drained. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality in any wet areas.

Most urban uses are affected by soil properties. The clayey subsoil and the wetness of the Camptown soils require special modifications and proper installation procedures so septic systems can function adequately. In addition, the high leaching potential and low strength of the Bienville soils must be compensated for in the design and construction of buildings, roads, and streets.

12. Franeau-Harris

Location in the survey area: Mainly in a narrow area along the lower third of Jefferson County
Landscape position: Coastal marsh
Slope: 0 to 1 percent slopes

Composition

Percent of the survey area: 2 percent
Franeau soils: 63 percent
Harris soils: 9 percent
Minor soils: 28 percent (including Meaton, Neel, and Zummo)

Soil Characteristics

Franeau

Surface layer:
0 to 4 inches; slightly acid, very slightly saline, black clay
Subsurface layer:
4 to 16 inches; slightly acid, very slightly saline, black clay
16 to 21 inches; slightly acid, very slightly saline, very dark gray
Subsoil:
21 to 27 inches; slightly acid, slightly saline, very dark gray clay with brown
27 to 61 inches; neutral, slightly saline, gray clay with yellow mottles
61 to 80 inches; moderately alkaline, slightly saline, gray clay with yellow mottles
Drainage class: Poorly drained
Seasonal high water table: A water table occurs at from the surface to a depth of 1.5 feet from September through May

Harris

Surface layer:
0 to 3 inches; very strongly acid, very slightly saline, very dark gray clay
3 to 22 inches; strongly acid, slightly saline, very dark gray clay with brown mottles
22 to 55 inches; strongly acid, slightly saline, light gray clay with gray and brown mottles
55 to 80 inches; strongly acid, slightly saline, light gray clay
Drainage class: Very poorly drained
Seasonal high water table: A water table occurs from the surface to a depth of 2.5 feet from September through June

Use and Management

This unit is mainly used as rangeland and as habitat for wildlife. A few areas are cropped to rice. It is not suited to pasture or woodland because of salinity.

Crops grown on this soil are limited to rice production. The salinity of the soil is too high for other commonly grown crops. Management must be done to minimize the existing salinity and to avoid accumulating any more salinity, especially in the surface. Drainage systems that include proper row direction and field drains with adequate outlets are needed to remove excess surface water after rains. A good fertility program is needed for consistent high production.

This soil is capable of producing high yields of marsh range grasses when properly managed. These areas are often utilized extensively by livestock in marsh pastures as bedding areas and refuge from floods and storms because they are drier and at a higher elevation than other marshes. As a result, these areas are often overgrazed and difficult to manage. Plant vigor can be maintained by proper stocking and by using a grazing rotation system. Prescribed burning also can be effectively used to help maintain plant vigor. Proper location of freshwater facilities and bedding areas for cattle also helps achieve proper grazing.

Most urban uses are affected by soil properties. The clayey texture, flooding, and wetness require special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets.

13. Vamont-Bevil

Location in the survey area: Mainly in the northern edge of Jefferson County and western Orange county
Landscape position: Upland forest
Slope: 0 to 2 percent slopes

Composition

Percent of the survey area: 1 percent
Franeau soils: 39 percent
Harris soils: 33 percent
Minor soils: 28 percent (including Aris, Estes, Orcadia, and Texla)

Soil Characteristics

Vamont

Surface layer:
0 to 3 inches; strongly acid, brown clay with red mottles
Subsoil:
3 to 11 inches; strongly acid, yellowish brown and light brownish gray clay with red mottles
11 to 30 inches; very strongly acid, light gray and yellowish brown clay
30 to 47 inches; very strongly acid, light gray clay with brown and red mottles
47 to 80 inches; strongly acid, grayish brown, brown, yellowish brown, and red clay
Drainage class: Somewhat poorly drained
Seasonal high water table: A perched water table occurs at a depth of 0.5 to 1.5 feet from January through March

Bevil

Surface layer:
0 to 9 inches; extremely acid, gray clay with brown mottles
Subsurface layer:
9 to 34 inches; extremely acid, gray to dark gray clay with yellow and brown mottles
Subsoil:
34 to 45 inches; very strongly acid, gray clay with yellow and brown mottles
45 to 55 inches; strongly acid, gray clay with brown mottles
55 to 80 inches; slightly acid to neutral, light gray clay with yellow and brown mottles
Drainage class: Poorly drained
Seasonal high water table: A perched water table occurs from the surface to a depth of 1.0 foot from November through March

Use and Management

This unit is mainly used as woodland, cropland, and native pasture. Rice is the main crop grown. This is a naturally forested site that mainly contains a mixed stand of hardwood and pine.

Woodland areas consist mainly of a mixed pine and oak forest. Commercial trees used for timber production are loblolly pine, southern red oak, water oak, and sweetgum. Wetness is the most limiting feature of this soil for production and harvesting of timber. The seasonal high water table restricts the use of equipment for much of the year. Seedling survival of some species is affected in those years following extended wet periods. The seasonal high water table restricts root development. Woodland practices such as selective thinning and removal of undesirable trees should be carried out to maximize production.

Crops grown on this soil are responsive to good management. This soil is sticky when wet, hard when dry, and can become cloddy when plowed. Although producers have equipment to till these soils, the structure and tilth can be adversely affected when it is tilled when it is too wet or too dry. Drainage systems that include proper row direction and field drains with adequate outlets are needed to remove excess surface water after rains. A good fertility program is needed for consistent high production.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality.

Most urban uses are affected by soil properties. Soil wetness, caused by very low surface runoff and a seasonal high water table, is a concern. The clayey texture of the soil also requires special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets.

14. Barbary

Location in the survey area: Mainly in the southeastern edge of Orange County
Landscape position: Coastal swamp
Slope: 0 to 1 percent slopes

Composition

Percent of the survey area: 1 percent
Barbary soils: 77 percent
Minor soils: 23 percent (including Camptown and Spurger)

Soil Characteristics

Barbary

Surface layer:
0 to 5 inches; very strongly acid, gray mucky clay
Underlying material:
5 to 48 inches; strongly acid to moderately acid, gray fluid clay
48 to 80 inches; moderately acid, gray fluid clay
Drainage class: Very poorly drained
Seasonal high water table: An apparent water table extends from the surface to a depth of more than 6 feet throughout the year

Use and Management

This unit is mainly used as habitat for wildlife. It is not suited to crop production, pasture, woodland, or rangeland because of salinity, flooding, tidal inundation, and wetness. This soil is too soft to support the weight of livestock under normal conditions. It is used extensively by many wetland wildlife species.

This soil is capable of producing high yields of marsh range grasses when properly managed. Proper management on this soil includes practices that prevent the highly organic soil surface from burning, maintaining the delicate plant community, and maintaining plant vigor. This soil can be easily destroyed by improper burning, changes in drainage, salinity, or water table.

Most urban uses are affected by soil properties. Flooding and long periods of wetness does not allow septic systems to function properly without extensive modifications. In addition, the low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete will reduce corrosion concerns.

15. Sabine-Baines

Location in the survey area: At the mouth of the Sabine Lake in Jefferson County
Landscape position: Coastal marsh
Slope: 0 to 2 percent slopes

Composition

Percent of the survey area: 1 percent
Sabine soils: 54 percent
Baines soils: 25 percent
Minor soils: 21 percent (including Barnett, Creole, and Neel)

Soil Characteristics

Sabine

Surface layer:
0 to 7 inches; moderately acid, very dark gray loamy fine sand
Subsurface layer:
7 to 12 inches; moderately acid, very dark grayish brown loamy fine sand with brown mottles
Subsoil:
12 to 23 inches; moderately acid, brown loamy fine sand with brown mottles
23 to 37 inches; moderately acid, light yellowish brown loamy fine sand with gray and brown mottles
37 to 57 inches; slightly acid, light yellowish brown and light brownish gray loamy fine sand with brown mottles
57 to 80 inches; neutral, gray loamy fine sand with brown and red mottles
Drainage class: Moderately well drained
Seasonal high water table: A water table occurs at a depth of 2.5 to 4.0 feet from September through May

Baines

Surface layer:
0 to 12 inches; slightly acid, slightly saline, black clay
Subsurface layer:
12 to 33 inches; moderately alkaline, slightly saline, gray or brown clay loam with brown mottles
33 to 48 inches; slightly alkaline, slightly saline, light brownish gray loamy fine sand with brown mottles
48 to 80 inches; lightly alkaline, slightly saline, strong brown, gray, and grayish brown loamy fine sand
Drainage class: Very poorly drained
Seasonal high water table: A water table occurs from the surface to a depth of 6 feet throughout the year

Use and Management

This unit is mainly used as range and urban land.

Cropland on this complex is generally not suited because Baines soils are too wet and saline for normal production. However, areas of the Sabine soils are cropped as small areas to a variety of crops that include vegetables and fruit crops.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass on the Sabine soils while the Baines soils are adapted to marsh range grasses. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality, but the Baines soil is usually impacted by wetland laws that need to be considered before any drainage is done.

This soil is capable of producing high yields of marsh range grasses when properly managed. Plant vigor can be maintained by proper stocking and by using a grazing rotation system. This area is used extensively by livestock as bedding areas because it is relatively dry. The extensive use as bedding areas makes plant management difficult because it is easily overused. Prescribed burning also can be effectively used to help maintain plant vigor. Proper location of freshwater facilities and bedding areas for cattle also helps achieve proper grazing.

Most urban uses are affected by soil properties. The clayey subsoil and the wetness of the Baines soils require special modifications and proper installation procedures so septic systems can function adequately. In addition, the high leaching potential and low strength on the Sabine soils must be compensated for in the design and construction of buildings, roads, and streets.

Detailed Soil Map Units

The map units delineated on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. 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 other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties 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, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit 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, 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, slope, salinity, 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, Barnett mucky peat, 0 to 1 percent slopes, frequently flooded, tidal is a phase of the Barnett series.

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

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Anahuac-Aris complex, 0 to 1 percent slopes is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Oil wasteland is an example.

Table 4 shows the acreage and proportionate extent of each map unit. Other 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 or miscellaneous areas.

AmA—Allemands mucky peat, 0 to 1 percent slopes, frequently flooded, tidal

Map Unit Setting

General location: Gulf Coast Marsh of southeast Texas
Major land resource area: 151
Geomorphic setting: Freshwater marsh
Elevation: 0 to 7 feet (0 to 2 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Allemands soil and similar soils: 85 percent
Contrasting soils: Included with this soil in mapping are areas of Creole, Franeau, Harris, Zummo soils, and water bodies. All included soils have an organic surface less than 16 inches thick.

Component Description

Component geomorphic setting: Marsh
Parent material: Firm, clayey backswamp deposits
Typical vegetation: Maidencane, bulltongue, cattail, bulrush, cutgrass, longtom

Typical Profile

Surface layer:
0 to 18 inches; strongly acid, very dark gray, mucky peat
Subsurface layer:
18 to 28 inches; slightly acid, very dark gray, clay
Underlying material:
28 to 80 inches; neutral, gray, clay with brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Sodic within 40 inches
Available water capacity: About 12.6 inches (very high)

Component Hydrologic Properties

Natural drainage class: Very poorly drained
Runoff: Negligible
Annual flooding: Frequent for very long periods from upland runoff and periodic storm tides
Annual ponding: Frequent for very long periods from the surface to 1 foot above the surface
Seasonal high water table: A water table extends from the surface to a depth of more than 6 feet throughout the year

Interpretive Groups

Land capability nonirrigated: 8w
Land capability irrigated: Not assigned
Ecological site name: Fluid Fresh Marsh

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in marsh. It is mainly used as habitat for wildlife. It is not suited to crop production, range, pasture, or woodland because of thick organic surface and wetness.

This soil is very susceptible to marsh erosion processes that allow the soil surface to be removed by water and alter the adapted plant community. The end result of this marsh erosion is usually unvegetated barren areas. These areas are very difficult to revegetate. Flooding is also a hazard.

This soil is capable of producing medium yields of marsh range grasses when properly managed. The organic surface of the soil makes it unsuitable for livestock grazing because it will not support the weight of livestock. Prescribed burning can be effectively used to help maintain plant vigor but extreme caution should be used to prevent marsh erosion by maintaining the organic soil surface.

Most urban uses are affected by soil properties. The organic nature of the soil, clayey texture, flooding, and permanently saturated soil conditions does not allow septic systems to function properly without extensive modifications. In addition, the low strength of the soil must also be compensated for in the design and construction of buildings, roads, and streets.

The Allemands soil is used by game and nongame wildlife. The marsh provides habitat for a variety of mammals, birds, and reptiles. This is also an important part of the marine estuary ecosystem by providing an abundant amount of detritus.

AnA—Anahuac very fine sandy loam, 0 to 2 percent slopes

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas
Major land resource area: 150A
Geomorphic setting: Low ridge
Elevation: 10 to 49 feet (3 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Anahuac soils and similar soils: 85 percent
Contrasting soils: Included with this soil in mapping are areas of Aris, Labelle, Leton, and Spindletop soils. The Aris soil has a higher seasonal water table and is on a lower landscape position. The Labelle soil has a thinner surface layer and is on a lower landscape position. The Leton soil has loamy subsoil and is in a depression. Spindletop soil is on a higher landscape position.

Component Description

Component geomorphic setting: Ridge
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Big bluestem, brownseed paspalum, little bluestem, yellow indiangrass, eastern gamagrass

Typical Profile

Surface layer:
0 to 7 inches; very strongly acid, very dark grayish brown, very fine sandy loam
Subsurface layer:
7 to 18 inches; very strongly acid, dark brown loam
Subsoil:
18 to 22 inches; very strongly acid, grayish brown and yellowish brown loam with brown mottles
22 to 41 inches; very strongly acid, dark gray clay with red mottles
41 to 54 inches; strongly acid, light brownish clay loam with yellow and red mottles
54 to 80 inches; slightly acid, light gray loam with yellow, gray, and brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 2 percent, the slope averages about 0.3 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.6 inches (High)

Component Hydrologic Properties

Natural drainage class: Moderately well drained
Runoff: Medium
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 16 to 24 inches from November to March. An apparent water table exists from a depth of 4.0 feet to more than 6.0 feet from November through April.

Interpretive Groups

Land capability nonirrigated: 2w
Land capability irrigated: 2w
Ecological site name: Loamy Prairie

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in prairie although forests have encroached in some areas. It is mainly used as cropland and pasture. The main crop grown is soybean. It is not extensively used for rice production because it has a thick loamy surface, has too much slope in most areas, and is generally too high on the landscape to deliver irrigation water to the area.

Crops grown on this Anahuac soil are responsive to good management. Favorable soil structure and tilth can be maintained or improved by incorporating crop residue in the surface layer and tilling during the correct moisture content. This soil tends to be droughty and can become hard during prolonged dry periods in the summer. Wetness is not a significant problem in this soil when compared to many of the cropped soils in the survey area. Plowing, planting, and cultivating should be done in a timely manner to conserve moisture for the late spring and summer period. Proper row direction will help to remove surface water following heavy rains but caution should be used so soil erosion is not a problem. The application of lime should be considered to reduce the acidity of the soil whenever possible. This soil has less natural fertility than many of the other commonly cropped soils so a good fertility program is essential to obtain high yields.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system and proper use of fertilizer increases forage yields and improves quality. Cool-season legumes produce winter forage while adding nitrogen to the soil. However, a higher degree of management is needed for best results.

Most urban uses are affected by soil properties. The high shrink-swell potential and low strength of the subsoil still require some modifications and proper installation procedures so septic systems can function properly. In addition, these properties must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete will reduce corrosion concerns. The use of pipes made from less corrosive metals and materials can be suitable alternatives to steel.

The Anahuac soil is used by game and nongame wildlife. The prairie, cropland, and forested areas provide habitat for a variety of mammals, birds, and reptiles.

AsA—Anahuac-Aris complex, 0 to 1 percent slopes

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas
Major land resource area: 150A
Geomorphic setting: Meander scroll
Elevation: 7 to 49 feet (2 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Anahuac soils and similar soils: 60 percent
Aris soils and similar soils: 25 percent
Contrasting soils: Included with these soils in mapping are areas of Labelle, Leton, and Spindletop soils. The Labelle soil has a thinner surface layer and is on a lower landscape position. The Leton soil has loamy subsoil and is in a depression. The Spindletop soil is on a higher landscape position. Also included are soils similar to Anahuac that have a high water table and a soil like Aris that is somewhat poorly drained.

Anahuac

Component Description

Component geomorphic setting: Ridge
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Big bluestem, brownseed paspalum, little bluestem, yellow indiangrass, eastern gamagrass

Typical Profile

Surface layer:
0 to 10 inches; very strongly acid, very dark grayish brown loam
Subsurface layer:
10 to 19 inches; very strongly acid, very dark grayish brown loam
Subsoil:
19 to 24 inches; very strongly acid, grayish brown loam with brown mottles
24 to 45 inches; strongly acid, dark gray clay with red mottles
45 to 52 inches; strongly acid, light brownish gray clay loam with yellow and red mottles
52 to 80 inches; slightly acid, light brownish gray sandy clay loam

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the overall slope averages less than 1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.6 inches (High)

Component Hydrologic Properties

Natural drainage class: Moderately well drained
Runoff: Medium
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 19 to 24 inches from November to March. An apparent water table exists from 4.0 feet to more than 6.0 feet from November through April.

Interpretive Groups

Land capability nonirrigated: 2w
Land capability irrigated: 2w
Ecological site name: Loamy Prairie

Aris

Component Description

Component geomorphic setting: Flat
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Flatsedge, spikerush, Florida paspalum, maidencane, switchgrass

Typical Profile

Surface layer:

0 to 6 inches; very strongly acid, dark grayish brown silt loam with brown mottles
6 to 14 inches; very strongly acid, light brownish gray and grayish brown silty clay loam with brown and gray mottles
14 to 23 inches; very strongly acid, dark gray silty clay with brown and gray mottles
23 to 72 inches; moderately acid, light brownish gray clay with gray, brown, and red mottles
72 to 80 inches; neutral, light gray clay with yellow and brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the overall slope averages less than 1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 8.7 inches (Moderate)

Component Hydrologic Properties

Natural drainage class: Poorly drained
Runoff: Negligible
Annual flooding: Not flooded
Annual ponding: Frequent for long periods from the surface to 4 inches above the surface from November to March
Seasonal high water table: A water table occurs from the surface to a depth of 2 feet from November to March

Interpretive Groups

Land capability nonirrigated: 4w
Land capability irrigated: 4w
Ecological site name: Lowland

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in prairie but encroachment of forest has occurred in some areas. The soils in this complex are used mainly as pasture. A few areas are in rangeland and cropland.

Crops grown on this complex are responsive to good management. The major concerns are the nonuniform slope, and the Aris soils may remain wet for extended periods of time following rains. Also of concern is that the Anahuac soils typically have a low pH. The Aris part of the unit is slightly sticky when wet, hard when dry, and can become cloddy when plowed. Favorable soil structure and tilth can be maintained or improved by incorporating crop residue in the surface layer and tilling at the correct moisture content. Plowpans that restrict the downward movement of water and air may occur in the Aris soil areas that can be detrimental to dryland crop production because roots cannot readily penetrate the pan to obtain moisture and nutrients. Drainage systems that are well planned are usually needed to remove excess surface water from the Aris soil areas after rains. This usually involves several relatively large field drains. The Anahuac soil areas typically need a liming program to increase the pH of the upper part of the soil for good production. A good fertility program is needed for consistent high production.

Rice, grown as an irrigated crop, generally has many concerns. Normally, only the edge areas associated with other soil areas are used for rice production. The topography of the area to too complex to provide adequate water control over a large area, drainage is too complex to be practical, and water delivery system is usually impractical by gravity flow.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. Cool-season legumes produce winter forage while adding nitrogen to the soil. However, a higher degree of management for legumes is needed for best results.

Native range grasses, when properly managed, are capable of producing medium yields on this unit. Soil wetness, caused by very slow to ponded surface runoff, is a concern. Good management that includes establishment and maintenance of good plant vigor and growth in the Aris soil areas increases the overall production of this soil unit.

Most urban uses are affected by soil properties. The clayey subsoils and the wetness of the Aris soil require special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the Aris soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete will reduce corrosion concerns. The use of pipes made from less corrosive metals and materials can be suitable alternatives to steel.

This complex is used by game and nongame wildlife. With management, this area can provide very good habitat for a variety of mammals, birds, crustaceans, and reptiles.

AuA—Anahuac-Urban land complex, 0 to 2 percent slopes

Map Unit Setting

General location: Gulf Coast Prairie of southeast Texas
Major land resource area: 150A
Geomorphic setting: Low Ridge with urban sprawl
Elevation: 10 to 49 feet (3 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Anahuac soils and similar soils: 65 percent
Urban Land: 35 percent
Contrasting soils: Included with this soil in mapping are areas of Labelle soils. The Labelle soil has a thinner surface layer and is on a lower landscape position than the Anahuac soil.

Anahuac

Component Description

Component geomorphic setting: Anahuac soils are in lots, yards, and other open areas
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Big bluestem, brownseed paspalum, little bluestem, yellow indiangrass, eastern gamagrass

Typical Profile

Surface layer:
0 to 7 inches; very strongly acid, very dark grayish brown very fine sandy loam
Subsurface layer:
7 to 18 inches; very strongly acid, brown loam
Subsoil:
18 to 22 inches; very strongly acid, grayish brown and yellowish brown loam with brown mottles
22 to 41 inches; strongly acid, dark gray clay with red and brown mottles
41 to 54 inches; strongly acid, light brownish gray clay loam with yellow and red mottles
54 to 80 inches; slightly acid, light gray loam with yellow, gray, red, and brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 2 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.6 inches (High)

Component Hydrologic Properties

Natural drainage class: Moderately well drained
Runoff: Medium
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 18 to 22 inches from November to March. An apparent water table exists from 4.0 feet to more than 6.0 feet from November through April.

Interpretive Groups

Land capability nonirrigated: 2w
Land capability irrigated: 2w
Ecological site name: Loamy Prairie

Urban Land

Component Description

Component geomorphic setting: Urban sprawl
Parent material: Not described
Typical vegetation: Not described

Component Properties and Qualities

Slope: 0 to 2 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: Very low

Component Hydrologic Properties

Natural drainage class: Not described

Runoff: Very high
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: Not described

Interpretive Groups

Land capability nonirrigated: 8s
Land capability irrigated: Not assigned
Ecological site name: Not assigned

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Most urban uses are affected by soil properties. Soil wetness, caused by very low surface runoff, is a concern. The clayey texture of the subsoil also requires special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the subsoil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete will reduce corrosion concerns. The use of pipes made from less corrosive metals and materials can be suitable alternatives to steel.

BaA—Bancker mucky peat, 0 to 1 percent slopes, frequently flooded, tidal

Map Unit Setting

General location: Gulf Coast Marsh of southeast Texas (fig. 3)
Major land resource area: 151
Geomorphic setting: Brackish marsh
Elevation: 0 to 13 feet (0 to 4 meters)
Mean annual precipitation: 54 to 60 inches (1,372 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Bancker and similar soils: 85 percent.
Contrasting soils: Included with this soil in mapping are areas of Barnett, Creole, Franeau, Harris, Ijam, Veston soils, and water bodies. The Barnett, Franeau, Harris, Ijam, and Veston soils have thicker surfaces of firm soil. The Veston soil also has a loamy surface. The Creole soil is less fluid in the upper 40 inches of the surface. Also included are soils similar to Bancker that have excess sulfides in the underlying material.

Component Description

Component geomorphic setting: Marsh
Parent material: Fluid clayey backswamp deposits
Typical vegetation: Marshhay cordgrass, seashore saltgrass, olney bulrush, coastal waterhysop, saltmarsh bulrush

Typical Profile

Surface layer:
0 to 9 inches; slightly acid, moderately saline, very fluid dark gray mucky peat
Underlying material:

Figure 3.—A small marsh pond, used extensively by wildlife, in an area of Bancker mucky peat, 0 to 1 percent slopes, frequently flooded, tidal. The Bancker soils are in the Fluid Brackish Marsh ecological site.

9 to 41 inches; neutral, strongly saline, very fluid dark gray clay
41 to 80 inches; slightly acid, strongly saline, very fluid gray clay

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Saline within 40 inches
Sodicity: Sodic within 40 inches
Available water capacity: About 11.2 inches (High)

Component Hydrologic Properties

Natural drainage class: Very poorly drained
Runoff: Negligible
Annual flooding: Frequent for very long periods by runoff from the uplands, unusually high spring tides, and periodic storm tides throughout the year
Annual ponding: Frequent from the surface to 1 foot above the surface for very long periods throughout the year
Seasonal high water table: An apparent water table extends from the surface to more than 6.0 feet throughout the year

Interpretive Groups

Land capability nonirrigated: 8w
Land capability irrigated: Not assigned
Ecological site name: Fluid Brackish Marsh

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in marsh. It is mainly used as habitat for wildlife. It is not suited to crop production, pasture, or woodland because of salinity and wetness and the fluid nature of the soil. This soil is very fluid which makes it unsuitable for general livestock grazing.

This soil is very susceptible to marsh erosion processes that allow the soil surface to be removed by water and alter the adapted plant community. The end result of this marsh erosion is usually unvegetated barren areas. These areas are very difficult to revegetate. Flooding is also a hazard.

This soil is capable of producing medium yields of marsh range grasses when properly managed. The fluid nature of the soil makes it unsuitable for livestock grazing because it will not support the weight of livestock. Prescribed burning can be effectively used to help maintain plant vigor but extreme caution should be used to prevent marsh erosion by maintaining the organic soil surface.

Most urban uses are affected by soil properties. The fluid nature of the soil, clayey texture, flooding, and permanently saturated soil conditions does not allow septic systems to function properly without extensive modifications. In addition, the low strength of the soil must also be compensated for in the design and construction of buildings, roads, and streets.

The Bancker soil is used by game and nongame wildlife. The marsh provides habitat for a variety of mammals, birds, crustaceans, gastropods, and reptiles. This area is also an important part of the marine estuary ecosystem by providing an abundant amount of detritus.

BbA—Barbary mucky clay, 0 to 1 percent slopes, frequently flooded

Map Unit Setting

General location: Flood plains of southeast Texas (fig. 4)
Major land resource area: 151
Geomorphic setting: Freshwater swamp
Elevation: 0 to 49 feet (0 to 15 meters)
Mean annual precipitation: 50 to 62 inches (1,270 to 1,575 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Barbary and similar soils: 85 percent
Contrasting soils: Included with this soil in mapping are areas of Estes, Fausse, and Caplen soils. The Estes and Fausse soils are not fluid. The Caplen soils are more saline.

Component Description

Component geomorphic setting: Swamp
Parent material: Fluid clayey backswamp deposits
Typical vegetation: Bald cypress, water tupelo, swamp maple, bay

Typical Profile

Surface layer:
0 to 5 inches; very strongly acid, gray mucky clay

Figure 4.—This cutover cypress swamp is in an area of Barbary mucky clay, 0 to 1 percent slopes, frequently flooded. This soil provides habitat for wetland wildlife.

Underlying material:
5 to 48 inches; strongly acid to moderately acid, gray fluid clay
48 to 80 inches; moderately acid, gray fluid clay

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 11.2 inches (High)

Component Hydrologic Properties

Natural drainage class: Very poorly drained
Runoff: Negligible
Annual flooding: Frequent for very long periods by runoff from the uplands and periodic storm tides throughout the year
Annual ponding: Frequent from the surface to 1 foot above the surface for very long periods throughout the year
Seasonal high water table: An apparent water table extends from the surface to a depth of more than 6.0 feet throughout the year

Interpretive Groups

Land capability nonirrigated: 8w
Land capability irrigated: Not assigned
Ecological site name: Not assigned

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in swamp dominated by cypress. This soil is mainly used as habitat for wildlife. It is not suited to crop production, pasture, woodland, or rangeland because of salinity, flooding, tidal inundation, and wetness. This soil is too soft to support the weight of livestock under normal conditions.

This soil is capable of producing high yields of marsh range grasses when properly managed. Proper management on this soil includes practices that prevent the highly organic soil surface from burning, maintaining the delicate plant community, and maintaining plant vigor. This soil can be easily destroyed by improper burning, changes in drainage, salinity, or water table. Most urban uses are affected by soil properties. Flooding, and long periods of wetness does not allow septic systems to function properly without extensive modifications. In addition, the low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete will reduce corrosion concerns. The use of pipes made from less corrosive metals and materials can be suitable alternatives to steel.

The Barbary soil is used by nongame wildlife. The marsh provides habitat for a variety of birds, crustaceans, and reptiles. This is also an important part of the marine estuary ecosystem by providing an abundant amount of detritus.

BcA—Barnett mucky peat, 0 to 1 percent slopes, frequently flooded, tidal

Map Unit Setting

General location: Gulf Coast Marsh of southeast Texas
Major land resource area: 151
Geomorphic setting: Brackish Marsh
Elevation: 0 to 7 feet (0 to 2 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Barnett and similar soils: 85 percent
Contrasting soils: Included with this soil in mapping are small areas of Bancker, Creole, Franeau, Harris, and Veston soils. The Bancker and Creole soils are fluid throughout. The Franeau soils are less saline and on a higher landscape position. The Harris soils are firm throughout. The Veston soils are loamy throughout. Also included is Barnett silty clay loam.

Component Description

Component geomorphic setting: Marsh
Parent material: Firm clayey backswamp deposits
Typical vegetation: Marshhay cordgrass, seashore saltgrass, seashore paspalum, bushy sea-oxeye, bulrush

Typical Profile

Surface layer:
0 to 2 inches; very strongly acid, slightly saline, very dark gray mucky peat
Subsurface layer:
2 to 6 inches; slightly acid, moderately saline, dark gray clay

Subsoil:
6 to 22 inches; slightly acid, moderately or strongly saline, gray clay with brown mottles
Underlying material:
22 to 80 inches; neutral, strongly saline, gray fluid mucky clay with gray and brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 7.9 inches (Moderate)

Component Hydrologic Properties

Natural drainage class: Very poorly drained
Runoff: High
Annual flooding: Frequent for long periods by runoff from the uplands, unusually high spring tides, and periodic storm tides throughout the year
Annual ponding: Not ponded
Seasonal high water table: An apparent water table extends from the surface to 1 foot below the surface to more than 6 feet throughout the year

Interpretive Groups

Land capability nonirrigated: 6w
Land capability irrigated: Not assigned
Ecological site name: Firm Intermediate Marsh

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in marsh. It is mainly used as rangeland and as habitat for wildlife. It is not suited to crop production, pasture, or woodland because of salinity and wetness. Flooding is also a hazard.

This soil is capable of producing high yields of marsh range grasses when properly managed. Plant vigor can be maintained by proper stocking and by using a grazing rotation system. Prescribed burning also can be effectively used to help maintain plant vigor. Proper location of freshwater facilities and bedding areas for cattle also helps achieve proper grazing.

Most urban uses are affected by soil properties. Clayey texture, flooding, and long periods of wetness does not allow septic systems to function properly without extensive modifications. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets.

The Barnett soils are used by game and nongame wildlife. The marsh provides habitat for a variety of mammals, birds, crustaceans, gastropods, and reptiles. This is also an important part of the marine estuary ecosystem by providing an abundant amount of detritus.

BeA—Barnett silty clay loam, 0 to 1 percent slopes, frequently flooded, tidal

Map Unit Setting

General location: Gulf Coast Marsh of southeast Texas (fig. 5)
Major land resource area: 151
Geomorphic setting: Brackish marsh
Elevation: 0 to 7 feet (0 to 2 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Barnett and similar soils: 85 percent
Contrasting soils: Included with this soil in mapping are small areas of Barnett mucky peat, Creole, Harris, and Veston soils. The Creole soils are fluid throughout. The Harris soils are clayey throughout. The Veston soils are loamy throughout. The Barnett mucky peat has a thicker organic surface.

Component Description

Component geomorphic setting: Marsh
Parent material: Firm clayey backswamp deposits
Typical vegetation: Marshhay cordgrass, seashore saltgrass, seashore paspalum, bushy sea-oxeye, bulrush

Typical Profile

Surface layer:
0 to 4 inches; moderately acid, slightly saline, dark gray silty clay loam
Subsurface layer:
4 to 32 inches; slightly acid, moderately saline, dark gray clay with gray mottles
32 to 80 inches; slightly acid, moderately saline, gray fluid mucky clay with black, olive, and gray mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 7.8 inches (Moderate)

Component Hydrologic Properties

Natural drainage class: Very poorly drained
Runoff: High
Annual flooding: Frequent for long periods by runoff from the uplands, unusually high spring tides, and periodic storm tides throughout the year
Annual ponding: Not ponded
Seasonal high water table: An apparent water table extends from the surface to 2.5 feet below the surface to more than 6 feet throughout the year

Interpretive Groups

Land capability nonirrigated: 6w

Figure 5.—An area where the geese have grazed out the vegetation is locally called an "eatout." The area is Barnett silty clay loam, 0 to 1 percent slopes, frequently flooded, tidal, which is in the Firm Brackish Marsh ecological site.

Land capability irrigated: Not assigned
Ecological site name: Firm Brackish Marsh

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in marsh. It is mainly used as rangeland and as habitat for wildlife. It is not suited to crop production, pasture, or woodland because of salinity and wetness. Flooding is also a hazard.

This soil is capable of producing high yields of marsh range grasses when properly managed. Plant vigor can be maintained by proper stocking and by using a grazing rotation system. Prescribed burning also can be effectively used to help maintain plant vigor. Proper location of freshwater facilities and bedding areas for cattle also helps achieve proper grazing.

Most urban uses are affected by soil properties. Septic tank adsorption fields should be designed to reduce the affects of the clayey texture, flooding, and wetness. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets.

The Barnett soil is used by game and nongame wildlife. The marsh provides habitat for a variety of mammals, birds, crustaceans, gastropods, and reptiles.

Bh—Beaches, very frequently flooded, tidal

Map Unit Setting

General location: Gulf Coast of southeast Texas (fig. 6)
Major land resource area: 150B
Geomorphic setting: Beach
Elevation: 0 to 3 feet (0 to 1 meters)

Figure 6.—Normal tide in an area of Beaches, very frequently flooded, tidal. These areas are used for recreation.

Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Component Description

Component geomorphic setting: Beach
Parent material: Well sorted sand, clay, and shell fragments
Typical vegetation: Not described

Component Properties and Qualities

Slope: 0 to 1 percent
Slowest permeability class in the soil profile: Very rapid
Salinity: Saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 0.6 inches (Very low)

Component Hydrologic Properties

Natural drainage class: Very poorly drained
Runoff: Negligible
Annual flooding: Frequent
Annual ponding: Not ponded
Seasonal high water table: An apparent water table extends from the surface to 0.5 feet below the surface to more than 6 feet throughout the year

Interpretive Groups

Land capability nonirrigated: 8s
Land capability irrigated: Not assigned
Ecological site name: Not assigned

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

This unit consists of areas along the Gulf of Mexico between the mean low tide and the front of dunes or to vegetated areas along the coast. The mapped areas range from 50 to several hundred acres.

Beaches are not suitable for cropland, pasture, rangeland, or forestland. The areas are barren. These areas are used extensively as recreation areas.

BmA—Beaumont clay, 0 to 1 percent slopes

Map Unit Setting

General location: Gulf Coast Prairie of southeast Texas
Major land resource area: 150A
Geomorphic setting: Depression
Elevation: 7 to 49 feet (2 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Beaumont and similar soils: 85 percent
Contrasting soils: Included with this soil in mapping are areas of China, Labelle, and League soils. All of these soils have a darker colored surface, are better drained, and generally occur in slightly higher positions on the landscape. The Labelle soils have a loamy surface.

Component Description

Component geomorphic setting: Depression
Parent material: Clayey sediments of the Beaumont Formation
Typical vegetation: Little bluestem, indiangrass, Florida paspalum, knotroot bristlegrass, brownseed paspalum, sedges, rushes

Typical Profile

Surface layer:
0 to 5 inches; very strongly acid, dark gray clay with red and brown mottles
Subsurface layer:
5 to 9 inches; very strongly acid, dark gray clay with red and brown mottles
Subsoil:
9 to 19 inches; very strongly acid, dark gray clay with red and brown mottles
19 to 80 inches; very strongly acid, gray to light gray clay with red and yellow mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 10.1 inches (High)

Component Hydrologic Properties

Natural drainage class: Poorly drained
Runoff: Negligible
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 0.5 to 1.0 feet from November through March

Interpretive Groups

Land capability nonirrigated: 4w
Land capability irrigated: 4w
Ecological site name: Blackland

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in prairie. However, encroachment of forest has occurred in some areas. This soil is used as cropland, pasture, and rangeland. Rice and soybeans are the main crops grown. Some small grains are also grown. This soil is widely used for rice production because it has very little slope, it is very slowly permeable, and requires little mechanical leveling.

Crops grown on this soil are responsive to good management. This soil is sticky when wet, hard when dry, and can become cloddy when plowed. Although producers have equipment to till these soils, the structure and tilth can be adversely affected when it is tilled when it is too wet or too dry. Plowpans commonly occur in cultivated fields that can be detrimental to dryland crop production because roots cannot readily penetrate the pan to obtain moisture and nutrients. Depending on the crops to be grown, a liming program should be considered to decrease the acidity of the soil. Drainage systems that include proper row direction and field drains with adequate outlets are needed to remove excess surface water after rains. A good fertility program is needed for consistent high production.

Rice, grown as an irrigated crop, does not have many additional concerns. It is extensively farmed to rice because it is naturally level and has a fairly uniform slope.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. Cool-season legumes produce winter forage while adding nitrogen to the soil. However, a higher degree of management for legumes is needed for best results.

Native range grasses, when properly managed, are capable of producing high yields on this soil. Soil wetness caused by very low surface runoff and a seasonal high water table, is a concern.

Most urban uses are affected by soil properties. Soil wetness, caused by very low surface runoff and a seasonal high water table, is a concern. The clayey texture of the soil also requires special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete will reduce corrosion concerns. The use of pipes made from less corrosive metals and materials can be suitable alternatives to steel.

The Beaumont soil is used by game and nongame wildlife. Pastures, cropland, forests, and native grass areas provide habitat for a variety of mammals, birds, crustaceans, and reptiles.

BnA—Bevil clay, 0 to 1 percent slopes

Map Unit Setting

General location: Flatwoods of southeast Texas
Major land resource area: 152B
Geomorphic setting: Depression
Elevation: 26 to 49 feet (8 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 68 to 70 degrees F (20 to 21 degrees C)
Frost-free period: 250 to 300 days

Map Unit Composition

Bevil and similar soils: 85 percent
Contrasting soils: Included with this soil in mapping are areas of Beaumont, Estes, and Labelle soils. The Beaumont and Labelle soils are on slightly higher positions on the landscape and are on upland prairies. The Labelle soils have a loamy surface. The Estes soils are on flood plains along creeks and bayous.

Component Description

Component geomorphic setting: Depression
Parent material: Clayey sediments of the Beaumont Formation
Typical vegetation: Water oak, loblolly pine, sweetgum, paspalums, panicums, sedges, rushes

Typical Profile

Surface layer:
0 to 9 inches; extremely acid, gray clay with brown mottles
Subsoil:
9 to 34 inches; extremely acid, dark gray clay with yellow and brown mottles
34 to 45 inches; very strongly acid, gray, clay with yellow and brown mottles
45 to 80 inches; strongly acid to neutral, gray and light gray clay with brown and yellow mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 8.9 inches (Moderate)

Component Hydrologic Properties

Natural drainage class: Poorly drained
Runoff: Negligible
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs from the surface to a depth of 1.0 foot from November through March

Interpretive Groups

Land capability nonirrigated: 4w
Land capability irrigated: 4w

Ecological site name: Not Assigned
Woodland productivity class: 330 board feet per acre

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in forest. It is mainly used as woodland, cropland, and native pasture. Rice is the main crop grown. This is a naturally forested site that mainly contains a mixed stand of hardwood and pine.

Woodland areas consist mainly of a mixed pine and oak forest. Commercial trees used for timber production are loblolly pine, southern red oak, water oak, and sweetgum. Wetness is the most limiting feature of this soil for production and harvesting of timber. The seasonal high water table restricts the use of equipment for much of the year. Seedling survival of some species is affected in those years following extended wet periods. The seasonal high water table restricts root development. Trees occasionally are subject to windthrow during periods when the soil is wet. Using standard equipment with wheels or tracks on this soil causes rutting and compaction when the soil is wet. Puddling can occur during wet periods making unimproved roads and skid trails sticky, slick, and impassable. Woodland practices such as selective thinning and removal of undesirable trees should be carried out to maximize production.

Crops grown on this soil are responsive to good management. This soil is sticky when wet, hard when dry, and can become cloddy when plowed. Although producers have equipment to till these soils, the structure and tilth can be adversely affected when it is tilled when it is too wet or too dry. Plowpans commonly occur in cultivated fields that can be detrimental to dryland crop production because roots cannot readily penetrate the pan to obtain moisture and nutrients. Depending on the crops to be grown, a liming program should be considered to decrease the acidity of the soil. Drainage systems that include proper row direction and field drains with adequate outlets are needed to remove excess surface water after rains. A good fertility program is needed for consistent high production.

Rice, grown as an irrigated crop, does not have many additional concerns. It is naturally level and a uniform slope.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. Cool-season legumes produce winter forage while adding nitrogen to the soil. However, a higher degree of management for legumes is needed for best results.

Most urban uses are affected by soil properties. Soil wetness, caused by very low surface runoff and a seasonal high water table, is a concern. The clayey texture of the soil also requires special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets.

The Bevil soil is used by game and nongame wildlife. Pastures cropland, and forested areas provide habitat for a variety of mammals. birds, crustaceans, and reptiles.

BsB—Bienville loamy fine sand, 1 to 3 percent slopes

Map Unit Setting

General location: Alluvial Terraces of southeast Texas (fig. 7)
Major land resource area: 152B

Figure 7.—Loblolly pine on an area of Bienville loamy fine sand, 1 to 3 percent slopes.

Geomorphic setting: Stream terrace
Elevation: 7 to 49 feet (2 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 68 to 70 degrees F (20 to 21 degrees C)
Frost-free period: 250 to 310 days

Map Unit Composition

Bienville and similar soils: 85 percent
Contrasting soils: Included with this soil in mapping are areas of Spurger and Texla soils. The Spurger and Texla soils have a thinner surface layer and clayey subsoils.

Component Description

Component geomorphic setting: Ridge
Parent material: Sandy sediments of the Deweyville Formation
Typical vegetation: Splitbeard bluestem, American beautyberry, longleaf uniola, yaupon, pinehill bluestem

Typical Profile

Surface layer:
0 to 14 inches; moderately acid, brown loamy fine sand
Subsurface layer:
14 to 27 inches; strongly acid, strong brown and light brown loamy fine sand with brown mottles
Subsoil:
27 to 62 inches; strongly acid, light brown loamy fine sand
62 to 80 inches; strongly acid, pink loamy fine sand and fine sandy loam

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 1 to 3 percent, the slope averages about 2 percent
Slowest permeability class in the soil profile: Moderately rapid
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 5.8 inches (Low)

Component Hydrologic Properties

Natural drainage class: Somewhat excessively drained
Runoff: Very low
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A water table occurs at a depth of 4.0 to 6.0 feet from December through April

Interpretive Groups

Land capability nonirrigated: 2s
Land capability irrigated: Not assigned
Ecological site name: Not assigned
Woodland productivity class: 395 board feet per acre

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in forest. It is mainly used as woodland and pasture. This is a naturally forested site that mainly contains a mixed stand of hardwood and pine.

Woodland areas consist mainly of a mixed oak and pine forest. Commercial trees used for timber production are loblolly pine, longleaf pine, shortleaf pine. Seedling survival of some species is affected in those years following extended dry periods. The sandy surface makes mechanical operations difficult. Woodland practices such as selective thinning and removal of undesirable trees should be carried out to maximize production.

Crops grown on this soil are responsive to good management. The major concern is unevenness of the surface. These soils also have somewhat less natural fertility than other commonly used cropland areas in the survey area. Also of concern is that the unit typically has a low pH. Normally only the edges of these soil units are farmed when associated with other farmed areas. Favorable soil structure and tilth can be maintained or improved by incorporating crop residue in the surface layer and tilling at the correct moisture content. This unit typically needs a liming program to increase the pH of the upper part of the soil for good production. A good fertility program is needed for consistent high production.

Rice, grown as an irrigated crop, is not suited because the soil is too sandy.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. Liming may be needed to obtain good yields and quality. Cool-season legumes produce winter forage while adding nitrogen to the soil. However, a higher degree of management for legumes is needed for best results.

Most urban uses are affected by soil properties. Coating steel pipe and treating concrete will reduce corrosion concerns. The use of pipes made from less corrosive metals and materials can be suitable alternatives to steel.

The Bienville soil is used by game and nongame wildlife. With management, this area can provide good habitat for a variety of mammals, birds, and reptiles.

BtA—Bienville-Camptown complex, 0 to 1 percent slopes

Map Unit Setting

General location: Alluvial Terraces of southeast Texas
Major land resource area: 152B
Geomorphic setting: Stream terrace
Elevation: 7 to 49 feet (2 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 70 degrees F (21 to 21 degrees C)
Frost-free period: 250 to 300 days

Map Unit Composition

Bienville and similar soils: 50 percent
Camptown and similar soils: 35 percent
Contrasting soils: Included with these soils in mapping are areas of Spurger soils. The Spurger soils have clayey subsoils.

Bienville

Component Description

Component geomorphic setting: Ridge
Parent material: Sandy sediments of the Deweyville Formation
Typical vegetation: Splitbeard bluestem, American beautyberry, longleaf uniola, yaupon, pinehill bluestem

Typical Profile

Surface layer:
0 to 8 inches; strongly acid, dark grayish brown loamy fine sand
Subsurface layer:
8 to 12 inches; strongly acid, brown loamy fine sand with brown mottles
12 to 31 inches; strongly acid and very strongly acid, light brown and light yellow brown loamy fine sand
Subsoil:
31 to 53 inches; very strongly acid, strong brown loamy fine sand with red mottles
53 to 80 inches; very strongly acid, light brownish gray and very pale brown loamy fine sand with brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the overall slope averages about 0.2 percent
Slowest permeability class in the soil profile: Moderately rapid
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 5.9 inches (Low)

Component Hydrologic Properties

Natural drainage class: Somewhat excessively drained
Runoff: Negligible
Annual flooding: None
Annual ponding: Not ponded

Seasonal high water table: A water table occurs a at a depth of 4.0 to 6.0 feet from December through April

Interpretive Groups

Land capability nonirrigated: 2s
Land capability irrigated: Not assigned
Ecological site name: Not assigned
Woodland productivity class: 395 board feet per acre

Camptown

Component Description

Component geomorphic setting: Meandering channel
Parent material: Loamy and clayey sediments
Typical vegetation: Panicum, Alabama supplejack, Carolina jessamine, Pennsylvania smartweed

Typical Profile

Surface layer:
0 to 5 inches; strongly acid, dark gray silt loam
Subsurface layer:
5 to 17 inches; very strongly acid, light brownish gray and grayish brown loam and silt loam with gray and red mottles
Subsoil:
17 to 58 inches; extremely acid, grayish brown and gray clay loam with gray mottles
58 to 80 inches; very strongly acid, light brownish gray and light yellowish brown clay loam

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 8.9 inches (Moderate)

Component Hydrologic Properties

Natural drainage class: Very poorly drained
Runoff: Negligible
Annual flooding: None
Annual ponding: Frequent for long periods from the surface to 1 foot above the surface from December through August
Seasonal high water table: A water table occurs from the surface to a depth of more than 6.0 feet from December through August

Interpretive Groups

Land capability nonirrigated: 7w
Land capability irrigated: Not assigned
Ecological site name: Not assigned

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in forest. It is mainly used as woodland and pasture.

Woodland areas consist mainly of a mixed pine and oak forest. Commercial trees used for timber production are loblolly pine, longleaf pine, and shortleaf pine on the Bienville soil. The Camptown soil is not suited to conventional commercial production because of wetness. Wetness of the Camptown soil is the most limiting feature of this soil for production and harvesting of timber. The seasonal high water table restricts the use of equipment for much of the year. Seedling survival of some species is affected in those years following extended dry periods. Trees occasionally are subject to windthrow during periods when the soil is wet. Using standard equipment with wheels or tracks on this soil causes rutting when the soil is dry. Puddling occurs during wet periods on the Camptown soil making unimproved roads and skid trails slick and impassable. Woodland practices such as selective thinning and removal of undesirable trees should be carried out to maximize production.

Cropland on this complex needs intensive management for efficient production. Major concerns are the uneven surface topography and wetness. These soils also have less natural fertility than other commonly used cropland areas in the survey area. The Camptown soils remain wet for extended periods of time. Also of concern is that the unit typically has a low pH. Favorable soil structure and tilth can be maintained or improved by incorporating crop residue in the surface layer and tilling at the correct moisture content. Drainage systems that are well planned are usually needed to remove excess surface water from the Camptown soil areas after long periods of rain. This unit typically needs a liming program to increase the pH of the upper part of the soil for good production. A good fertility program is needed for consistent high production.

Rice, grown as an irrigated crop, has many concerns. The Bienville soil is too sandy and the topography of the area is too complex to provide efficient water control over a large area and drainage is usually complex.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. Cool-season legumes produce winter forage while adding nitrogen to the soil. However, a higher degree of management for legumes is needed for best results.

Most urban uses are affected by soil properties. The clayey subsoil and the wetness of the Bienville soil require special modifications and proper installation procedures so septic systems can function adequately. In addition, the high leaching potential and low strength of the Camptown soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete will reduce corrosion concerns. The use of pipes made from less corrosive metals and materials can be suitable alternatives to steel.

This complex is used by game and nongame wildlife. With management, this area can provide habitat for a variety of mammals, birds, crustaceans, and reptiles.

BwA—Bleakwood loam, 0 to 1 percent slopes, frequently flooded

Map Unit Setting

General location: Flood plains of southeast Texas
Major land resource area: 152B
Geomorphic setting: Flood plain
Elevation: 20 to 49 feet (6 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 68 to 70 degrees F (20 to 21 degrees C)
Frost-free period: 250 to 300 days

Map Unit Composition

Bleakwood soil and similar soils: 85 percent
Contrasting soils: Included with this soil in mapping are areas of Evadale, Camptown, and Texla soils. All of these soils are on higher landscape positions.

Component Description

Component geomorphic setting: Flood plain
Parent material: Loamy alluvium
Typical vegetation: Paspalum, panicum, pinehill bluestem, sedges

Typical Profile

Surface layer:
0 to 6 inches; moderately acid, brown loam
Subsoil:
6 to 15 inches; very strongly acid, light gray loam with yellow and brown mottles
15 to 27 inches; very strongly acid, light brownish gray loam with gray mottles
27 to 80 inches; very strongly acid, light brownish gray loam and clay loam with brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Moderate
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.8 inches (High)

Component Hydrologic Properties

Natural drainage class: Poorly drained
Runoff: Negligible
Annual flooding: Frequent flooding from uplands for long periods throughout the year
Annual ponding: Not ponded
Seasonal high water table: A water table occurs from the surface to a depth of 1.5 feet from November through May

Interpretive Groups

Land capability nonirrigated: 5w
Land capability irrigated: Not assigned
Ecological site name: Not assigned
Woodland suitability group: 310 board feet per acre

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in forest. It is mainly used as woodland. A few areas are used for pasture. This soil is not suited to cropland because it floods frequently.

Woodland areas consist mainly of bottomland hardwood oaks. Commercial trees used for timber production are sweetgum, water oak, and willow oak. Wetness and flooding are the most limiting feature for production and harvesting of timber. The seasonal high water table restricts the use of equipment to midsummer when the soil is dry. Woodland practices such as selective thinning and removal of undesirable trees should be carried out to maximize production.

Pasture on this soil is responsive to good management. Adapted pasture grasses include bahiagrass, dallisgrass, and tall fescue. Wetness and flooding limits the use of some equipment affects grass production, and affects grazing in most years. Proper use of fertilizer and lime, controlled grazing, and surface drainage improves yields while protecting the soil from erosion.

Most urban uses are affected by soil properties. Wetness, flooding, and clayey texture of the soil require special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete will reduce corrosion concerns. The use of pipes made from less corrosive metals and materials can be suitable alternatives to steel.

The Bleakwood soil is used by game and nongame wildlife. Pastures and forested areas provide habitat for a variety of mammals, birds, crustaceans, and reptiles.

CaA—Camptown silt loam, 0 to 1 percent slopes, ponded

Map Unit Setting

General location: Flatwoods of southeast Texas
Major land resource area: 152B
Geomorphic setting: Depression
Elevation: 10 to 36 feet (3 to 11 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 68 to 70 degrees F (20 to 21 degrees C)
Frost-free period: 250 to 300 days

Map Unit Composition

Camptown and similar soils: 85 percent
Contrasting soils: Included with this soil in mapping are areas of Bleakwood, Estes, and Evadale soils. The Bleakwood soils are on similar positions. The Estes soils are clayey. The Evadale soils occur on slightly higher positions. Also included are soils similar to Camptown that have brittle areas in the subsoil.

Component Description

Component geomorphic setting: Depression
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Panicum, Alabama supplejack, Carolina jessamine, Pennsylvania smartweed

Typical Profile

Surface layer:
0 to 8 inches; very strongly acid, dark gray silt loam with brown mottles
Subsurface layer:
8 to 14 inches; very strongly acid, dark gray silt loam with brown mottles
Subsoil:
14 to 40 inches; very strongly acid, gray and dark gray silty clay loam and silt loam with brown and gray mottles
40 to 80 inches; very strongly acid, dark gray silty clay with brown and red mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.2 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.2 inches (High)

Component Hydrologic Properties

Natural drainage class: Very poorly drained
Runoff: Negligible
Annual flooding: None
Annual ponding: Frequent from the surface to 1 foot above the surface for long periods throughout the year
Seasonal high water table: A water table occurs from the surface to a depth more than 6 feet throughout the year

Interpretive Groups

Land capability nonirrigated: 7w
Land capability irrigated: Not assigned
Ecological site name: Not assigned

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in forest. It is used as woodland and native pasture. It is not suited to cropland because of wetness.

Woodland areas consist of bottomland hardwoods. Commercial production is not practical on a commercial basis because of wetness.

Crops grown on this soil are responsive to good management but drainage is a problem for good production. This soil is slightly sticky when wet, hard when dry, and can become somewhat cloddy when plowed. The structure and tilth can be adversely affected when it is tilled too wet or too dry. Plowpans commonly occur in cultivated fields that can be detrimental to crop production because roots cannot readily penetrate the pan to obtain moisture and nutrients. Drainage systems are typically not practical. A good fertility program is needed for consistent high production.

Pasture on this soil is responsive to good management but prolonged wetness makes it difficult to achieve. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. Cool-season legumes produce winter forage while adding nitrogen to the soil.

Most urban uses are affected by soil properties. Soil wetness, caused by very low surface runoff and a seasonal high water table, is a concern. The clayey texture of the subsoil also requires special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduces corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

This Camptown soil is used by game and nongame wildlife. Pastures, cropland, forests, and native grass areas provide habitat for a variety of mammals, birds, crustaceans, and reptiles.

The Camptown soil is in capability subclass 7w, is not assigned to an ecological site.

CeA—Caplen mucky peat, 0 to 1 percent slopes, frequently flooded, tidal

Map Unit Setting

General location: Gulf Coast Marsh of southeast Texas
Major land resource area: 151
Geomorphic setting: Marsh
Elevation: 0 to 10 feet (0 to 3 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Caplen and similar soils: 85 percent
Contrasting soils: Included with this soil in mapping are areas of Creole and Harris soils. The Creole soils are less fluid soil. The Harris soils are not fluid throughout.

Component Description

Component geomorphic setting: Marsh
Parent material: Fluid clayey backswamp deposits
Typical vegetation: Marshhay cordgrass, softstem bulrush, olney bulrush, seashore paspalum, coast cockspur

Typical Profile

Surface layer:
0 to 12 inches; slightly acid, very slightly saline, very dark gray mucky peat
Subsurface layer:
12 to 37 inches; slightly acid to neutral, slightly saline, very dark gray mucky clay to clay with brown mottles in the lower part
Underlying material:
37 to 80 inches; neutral to slightly acid, slightly saline, light gray and dark gray fluid clay with black or brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Sodic within 40 inches
Available water capacity: About 9.0 inches (High)

Component Hydrologic Properties

Natural drainage class: Very poorly drained
Runoff: Negligible
Annual flooding: Frequent for very long periods by runoff from uplands and daily high tides throughout the year
Annual ponding: Frequent for very long periods from the surface to 1 foot above the surface throughout the year
Seasonal high water table: A water table occurs from the surface to a depth of more than 6.0 feet throughout the year

Interpretive Groups

Land capability nonirrigated: 8w
Land capability irrigated: Not assigned
Ecological site name: Fluid Intermediate Marsh

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in marsh. It is mainly used as habitat for wildlife. It is not suited to crop production, pasture, rangeland, or woodland because of salinity, flooding, tidal inundation, and wetness. This soil is too soft to support the weight of livestock under normal conditions.

This soil is capable of producing high yields of marsh range grasses when properly managed. Proper management on this soil includes practices that prevent the highly organic soil surface from burning, maintaining the delicate plant community, and maintaining plant vigor. This soil can be easily destroyed by improper burning, changes in drainage, or salinity.

Most urban uses are affected by soil properties. Flooding and long periods of wetness does not allow septic systems to function properly without extensive modifications. In addition, the low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

The Caplen soils are used by game and nongame wildlife. The marsh provides habitat for a variety of birds, crustaceans, and reptiles. This is also an important part of the marine estuary ecosystem by providing an abundant amount of detritus.

ChA—China clay, 0 to 1 percent slopes

Map Unit Setting

General location: Gulf Coast Prairie of southeast Texas
Major land resource area: 150A
Geomorphic setting: Plain
Elevation: 10 to 49 feet (3 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

China and similar soils: 85 percent
Contrasting soils: Included with this soil in mapping are small areas of Beaumont, Labelle, and League soils. These soils have less gypsum. The Beaumont soils are wetter and are on slightly lower landscape positions. The Labelle soils have a loamy surface layer and are on higher landscape positions. The League soils are on similar positions. Also included is a soil similar to China that is moderately alkaline and with or without carbonates below 60 inches.

Component Description

Component geomorphic setting: Plain
Parent material: Clayey sediments of the Beaumont Formation
Typical vegetation: Little bluestem, indiangrass, eastern gamagrass, switchgrass, Florida paspalum, brownseed paspalum, knotroot bristlegrass

Typical Profile

Surface layer:
0 to 4 inches; very strongly acid, very dark gray clay
Subsurface layer:
4 to 28 inches; very strongly acid, very dark gray clay with red and brown mottles
Subsoil:
28 to 55 inches; very strongly acid, dark gray clay with brown and red mottles, about 25 percent gypsum crystals in pockets
55 to 60 inches; strongly acid, gray clay with brown and red mottles, about 30 percent gypsum crystals in pockets
60 to 80 inches; moderately acid, gray clay with red and yellow mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 8.9 inches (Moderate)

Component Hydrologic Properties

Natural drainage class: Somewhat poorly drained
Runoff: High
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3w
Land capability irrigated: 3w
Ecological site name: Blackland

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in prairie. It is used as cropland, pasture, and rangeland. Rice is the main crop grown. This soil is widely used for rice production because it has very little slope, it is very slowly permeable, and requires little mechanical leveling.

Crops grown on this soil are responsive to good management. This soil is sticky when wet, hard when dry, and can become cloddy when plowed. The structure and tilth can be adversely affected if tilled when it is too wet or too dry. Plowpans commonly occur in cultivated fields that can be detrimental to dryland crop production because roots cannot readily penetrate the pan to obtain moisture and nutrients. Drainage systems that include proper row direction and field drains with adequate outlets are needed to remove excess surface water after rains. In some cases, the part of the soil that contains gypsum causes a nutrient imbalance. A good fertility program is needed for consistent high production.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. Cool-season legumes produce winter forage while adding nitrogen to the soil.

Native range grasses, when properly managed, are capable of producing high yields on this soil. Soil wetness, by low surface runoff and a seasonal high water table, is a concern.

Most urban uses are affected by soil properties. Soil wetness, caused by low surface runoff and a seasonal high water table, is a concern. The clayey texture of the soil also requires special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets. The presence of gypsum in part of the profile is another major concern for corrosion of steel and concrete. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

The China soil is used by game and nongame wildlife. Pastures, cropland, and rangeland areas provide habitat for a variety of mammals, birds, crustaceans, and reptiles.

CrA—Craigen loamy fine sand, 0 to 2 percent slopes

Map Unit Setting

General location: Gulf Coast Prairie of southeast Texas
Major land resource area: 150A
Geomorphic setting: Strand plain
Elevation: 16 to 30 feet (5 to 9 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 68 to 70 degrees F (20 to 21 degrees C)
Frost-free period: 250 to 300 days
Frost-free period: 260 to 310 days

Map Unit Composition

Craigen and similar soils: 85 percent
Contrasting soils: Included in this mapping unit are areas of Mollco. Also included are soils similar to Craigen that are somewhat poorly drained, have mollic colored surface layers, or have sandy surface layers more than 40 inches thick or less than 20 inches thick, have clayey subsoils, or are more alkaline. The Mollco soils are in long wet swales.

Component Description

Component geomorphic setting: Ridge
Parent material: Sandy sediments of the Beaumont Formation
Typical vegetation: Bluestems, panicums, longleaf uniola, yaupon, greenbrier

Typical Profile

Surface layer:
0 to 7 inches; very strongly acid, dark grayish brown loamy fine sand
Subsurface layer:
7 to 32 inches; very strongly acid, pale brown to brown loamy fine sand with brown and yellow mottles
Subsoil:
32 to 37 inches; very strongly acid, pale brown and strong brown sandy clay loam with light brownish gray albic material
37 to 49 inches; strongly acid, yellowish brown and strong brown sandy clay with light brownish gray albic material and red mottles
49 to 80 inches; moderately acid, gray and dark gray fine sandy loam with brown and red mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages 0.5 percent
Slowest permeability class in the soil profile: Moderate
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 6.7 inches (Moderate)

Component Hydrologic Properties

Natural drainage class: Moderately well drained
Runoff: Very low
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: An apparent water table occurs at a depth of 3.0 to 5.0 feet from January to April

Interpretive Groups

Land capability nonirrigated: 3s
Land capability irrigated: Not assigned
Ecological site name: Not assigned
Woodland productivity class: 330 board feet per acre

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in forest. A few areas are in pasture.

Woodland areas consist mainly of a mixed pine and oak forest. The commercial tree used for timber production is mainly loblolly pine. Equipment limitations because of the sandy surface are the most limiting features of this soil for production and harvesting of timber. Seedling survival of some species is affected in some years because of the sandy surface. Woodland practices, such as selective thinning and removal of undesirable trees, should be carried out to maximize production.

Crops grown on this soil are responsive to good management although few areas are presently used for crop production. The sandy surface is not well suited to crops normally grown in the area. The major concern is the sandy surface. This soil also has a lower natural fertility than other commonly used local cropland areas. Also of concern is the low pH. This unit typically needs a liming program to increase the pH of the upper part of the soil for good production. A good fertility program is needed for consistent high production.

Rice, gown as an irrigated crop, is not well suited to this soil because the permeability is too rapid, the surface is too sandy, and it is generally too high on the landscape for the delivery of irrigation water from canals in the area.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. Cool-season legumes produce winter forage while adding nitrogen to the soil.

Native range grasses, when properly managed, are capable of producing medium yields on this unit. The main concern is the low fertility level. Good management includes establishment and maintenance of good plant vigor and growth.

Most urban uses are affected by soil properties. The brief seasonal wetness may require some modifications so septic systems can function adequately. Coating steel pipe and treating concrete will reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

The Craigen soil is used by game and nongame wildlife. With management, this area can provide good habitat for a variety of mammals and birds.

CsA—Creole mucky peat, 0 to 1 percent slopes, frequently flooded, tidal

Map Unit Setting

General location: Gulf Coast Marsh of southeast Texas
Major land resource area: 151
Geomorphic setting: Brackish marsh
Elevation: 0 to 3 feet (0 to 1 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Creole and similar soils: 85 percent.
Contrasting soils: Included with this soil in mapping are areas of Bancker, Barnett, Franeau, Harris, Ijam, and Veston soils. The Bancker soils have an n value of more than 1 throughout. The Barnett, Franeau, Harris, Ijam, and Veston soils have less fluid soil surfaces. The Veston soils also has a loamy surface. Also included is a soil similar to Creole that has sulfidic materials in the subsoil.

Component Description

Component geomorphic setting: Marsh
Parent material: Fluid clayey backswamp deposits
Typical vegetation: Marshhay cordgrass, seashore saltgrass, olney bulrush, coastal waterhysop, saltmarsh bulrush, seashore paspalum

Typical Profile

Surface layer:
0 to 7 inches; neutral, slightly saline, dark gray very fluid mucky peat
Subsurface layer:
7 to 13 inches; slightly alkaline, slightly saline, dark gray fluid clay
Underlying material:
13 to 34 inches; slightly alkaline, moderately saline, gray fluid clay
34 to 58 inches; moderately acid, moderately saline, gray very fluid clay
58 to 80 inches; neutral, strongly saline, dark gray very fluid clay

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Saline within 40 inches
Sodicity: Sodic within 40 inches
Available water capacity: About 8.4 inches (Moderate)

Component Hydrologic Properties

Natural drainage class: Very poorly drained
Runoff: High

Annual flooding: Frequent for long periods throughout the year
Annual ponding: From the surface to 1 foot above the soil surface throughout the year
Seasonal high water table: A water table occurs from the surface to a depth of more than 6.0 feet throughout the year

Interpretive Groups

Land capability nonirrigated: 7w
Land capability irrigated: Not assigned
Ecological site name: Firm Brackish Marsh

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in marsh. It is mainly used as rangeland and as habitat for wildlife. It is not suited to crop production, pasture, or woodland because of salinity and wetness. This soil is fluid, but it can be grazed by livestock as long as good plant cover is maintained. This soil is easily susceptible to marsh erosion processes that allow the soil surface to be removed by erosion and alter the adapted plant community. This marsh erosion generally results in barren areas in the marsh, which are difficult to revegetate. Flooding is also a hazard.

This soil is capable of producing medium yields of marsh range grasses when properly managed. Good plant vigor, which promotes good root development, allows many areas of this soil to be suitable for livestock grazing because the root mat supports the weight of livestock. Plant vigor can be maintained by proper stocking and by using a rotation grazing system. Prescribed burning can also be effectively used to help maintain plant vigor but extreme caution should be used to prevent marsh erosion by protecting the organic soil surface from being burned.

Most urban uses are affected by soil properties. The fluid nature of the soil, clayey texture, flooding, and permanently saturated soil conditions does not allow septic systems to function properly without extensive modifications. In addition, the low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets.

The Creole soil is used by game and nongame wildlife. The marsh provides habitat for a variety of mammals, birds, crustaceans, and reptiles. This is also an important part of the marine estuary ecosystem by providing an abundant amount of detritus.

EsA—Estes clay, 0 to 1 percent slopes, frequently flooded

Map Unit Setting

General location: Flood plains of Southeast Texas
Major land resource area: 152B
Geomorphic setting: Flood plain
Elevation: 3 to 49 feet (1 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 68 to 70 degrees F (20 to 21 degrees C)
Frost-free period: 250 to 300 days

Map Unit Composition

Estes and similar soils: 85 percent
Contrasting soils: Included with this soil in mapping are small areas of Barbary and Fausse soils. Both soils are wetter and are in slightly lower positions.

Component Description

Component geomorphic setting: Flood plain
Parent material: Clayey alluvium
Typical vegetation: Alabama supplejack, sedges, longleaf uniola, beaked panicum, other panicums

Typical Profile

Surface layer:
0 to 4 inches; very strongly acid, brown clay with gray mottles
Subsoil:
4 to 11 inches; very strongly acid, strong brown clay with gray mottles
11 to 23 inches; very strongly acid, light brownish gray clay with brown mottles
23 to 80 inches; strongly acid, light brownish gray clay with red and brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 8.9 inches (Moderate)

Component Hydrologic Properties

Natural drainage class: Somewhat poorly drained
Runoff: High
Annual flooding: Frequently flooded by runoff from uplands from November through May
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at the surface to a depth of 1.5 feet from November through May

Interpretive Groups

Land capability nonirrigated: 5w
Land capability irrigated: Not assigned
Ecological site name: Not assigned
Woodland productivity class: 210 board feet per acre

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in forest. It is mainly used as woodland, cropland, and native pasture. Rice is the main crop grown.

Woodland areas consist mainly of a mixed hardwood forest. Commercial trees used for timber production are water oak and sweetgum. Wetness and flooding are the most limiting feature of this soil for the production and harvesting of timber. The seasonal high water table restricts the use of equipment for much of the year. Seedling survival of some species is affected in those years following extended wet periods. The seasonal high water table restricts root development. Trees occasionally are subject to windthrow during periods when the soil is wet. Using standard equipment with wheels or tracks on this soil causes rutting and compaction when the soil is wet. Puddling can occur during wet periods making unimproved roads and skid trails sticky, slick, and impassable. Woodland practices such as selective thinning and removal of undesirable trees should be carried out to maximize production.

Pasture on this soil is responsive to good management. Adapted pasture grasses include bahiagrass, dallisgrass, and tall fescue. A grazing management system, proper use of fertilizer and lime, and a drainage system increases forage yields and improves quality. Soil wetness and flooding limits the use of some equipment and affects grass production, and affects grazing in some parts of most years. Proper use of fertilizer and lime, controlled grazing, and surface drainage improve yields while protecting the soil from erosion. This soil has low inherent fertility.

Most urban uses are affected by soil properties. Wetness, flooding, and clayey texture of the soil require special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

The Estes soil is used by game and nongame wildlife. Pastures and forested areas provide habitat for a variety of mammals, birds, crustaceans, and reptiles.

EvA—Evadale silt loam, 0 to 1 percent slopes

Map Unit Setting

General location: Flatwoods of Southeast Texas
Major land resource area: 152B
Geomorphic setting: Plain
Elevation: 10 to 49 feet (3 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 68 to 70 degrees F (20 to 21 degrees C)
Frost-free period: 250 to 300 days

Map Unit Composition

Evadale and similar soils: 80 percent
Contrasting soils: Included with this soil in mapping are small areas of Camptown, Gist, and Texla soils. The Camptown soils occur in lower landscape positions. The Gist soils occur on mounds. The Texla soils occur on a slightly higher landscape position. Also included are soils similar to Evadale that have loamy subsoils, have fragipans, or brittle material.

Component Description

Component geomorphic setting: Plain
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Alabama supplejack, sedges, Carolina jointtail, Carolina jessamine, spike uniola

Typical Profile

Surface layer:
0 to 5 inches; very strongly acid, dark grayish brown silt loam
Subsurface layer:
5 to 9 inches; very strongly acid, light brownish gray silt with brown mottles
Subsoil:
9 to 14 inches; very strongly acid, light brownish gray silt loam and dark grayish brown silty clay loam with brown mottles
14 to 22 inches; very strongly acid, grayish brown silt loam and dark grayish brown silty clay loam with brown mottles

22 to 34 inches; very strongly acid, grayish brown silty clay and light brownish gray silt loam with yellow and brown mottles
34 to 46 inches; very strongly acid, grayish brown silty clay with yellow and brown mottles
46 to 55 inches; very strongly acid, light brownish gray silty clay with yellow mottles
55 to 80 inches; strongly acid, gray silty clay with brown and gray mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.2 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Sodic within 40 inches
Available water capacity: About 10.6 inches (High)

Component Hydrologic Properties

Natural drainage class: Poorly drained
Runoff: High
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table may exist at the surface to a depth of 1.5 feet from December through April

Interpretive Groups

Land capability nonirrigated: 4w
Land capability irrigated: Not assigned
Ecological site name: Not assigned
Woodland productivity class: 460 board feet per acre.

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in forest. It is used as woodland and native pasture. Some areas are cropped to rice. This soil is used for rice production because it does not have much slope, it is very slowly permeable, and does not require much mechanical leveling.

Woodland areas consist of pine and hardwood. Commercial trees used for timber production are slash pine and loblolly pine. Wetness is the most limiting feature of this soil for production and harvesting of timber. The seasonal high water table restricts the use of equipment to midsummer when the soil is drier. The seasonal high water table restricts root development. Trees occasionally are subject to windthrow during periods when the soil is wet. Using standard equipment with wheels or tracks on this soil causes rutting and compaction when the soil is wet. Puddling can occur during wet periods making unimproved roads and skid trails sticky, slick, and impassable. Woodland practices such as selective thinning and removal of undesirable trees should be carried out to maximize production.

Crops grown on this soil are responsive to good management. This soil is slightly sticky when wet, hard when dry, and can become somewhat cloddy when plowed. The structure and tilth can be adversely affected when it is tilled too wet or too dry. Plowpans commonly occur in cultivated fields that can be detrimental to dryland crop production because roots cannot readily penetrate the pan to obtain moisture and nutrients. Drainage systems that include proper row direction and field drains with adequate outlets are needed to remove excess surface water after rains. A good fertility program is needed for consistent high production.

Rice, grown as an irrigated crop, does not have many additional concerns. Evadale soil has a lower natural fertility level than soils commonly used for rice production. It is fairly level and typically has a uniform slope.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. Cool-season legumes produce winter forage while adding nitrogen to the soil.

Most urban uses are affected by soil properties. Soil wetness, caused by low surface runoff and a seasonal high water table, is a concern. The clayey texture of the soil also requires special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

This Evadale soil is used by game and nongame wildlife. Pastures, cropland, and forested and native grass areas provide habitat for a variety of mammals, birds, crustaceans, and reptiles.

FaA—Fausse clay, 0 to 1 percent slopes, frequently flooded

Map Unit Setting

General location: Flood plains of Southeast Texas (fig. 8)
Major land resource area: 152B
Geomorphic setting: Flood plain
Elevation: 7 to 49 feet (2 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 250 to 300 days

Map Unit Composition

Fausse and similar soils: 85 percent
Contrasting soils: Included with this soil in mapping are small areas of Bevil and Estes soils. Both soils are drier and are on slightly higher positions. Also included are areas that are similar to Fausse but pond water up to 2 feet above the surface during the winter and spring.

Component Description

Component geomorphic setting: Swamp
Parent material: Clayey backswamp deposits
Typical vegetation: Bald cypress, water tupelo, red maple

Typical Profile

Surface layer:
0 to 6 inches; strongly acid, gray clay
Subsoil:
6 to 14 inches; strongly acid, gray clay with olive mottles
14 to 26 inches; extremely acid, light gray clay with yellow mottles
26 to 55 inches; extremely acid, gray clay with yellow mottles
55 to 68 inches; extremely acid, light gray clay with yellow and brown mottles
68 to 80 inches; very strongly acid, gray clay

Figure 8.—An area of Fausse clay, 0 to 1 percent slopes, frequently flooded. This hardwood forest is inundated from upland runoff.

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 11.2 inches (High)

Component Hydrologic Properties

Natural drainage class: Very poorly drained
Runoff: Negligible
Annual flooding: Frequently flooded by runoff from uplands throughout the year
Annual ponding: Frequent for very long periods from the surface to 1 foot above the surface throughout the year
Seasonal high water table: A water table occurs from the surface to depth of more than 6 feet throughout the year

Interpretive Groups

Land capability nonirrigated: 7w
Land capability irrigated: Not assigned
Ecological site name: Not assigned

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in forest. It is used mainly as woodland. A few areas are used for pasture. This soil is not suited to cropland because it floods frequently.

Woodland areas consist mainly of cypress but some oak, ash, and tupelo occur. Commercial tree production is not practical because of wetness and flooding.

Pasture on this soil is responsive to good management. Adapted pasture grasses include bahiagrass, dallisgrass, and tall fescue. A grazing management system, proper use of fertilizer and lime, and a drainage system increases forage yields and improves quality. Wetness in the soil profile and flooding limits the use of some equipment, affects grass production, and affects grazing in some parts of most years. Proper use of fertilizer and lime, controlled grazing, and surface drainage improve yields while protecting the soil from erosion. This soil has low inherent fertility.

Most urban uses are affected by soil properties. Wetness, flooding, and clayey texture of the soil require special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

The Fausse soil is used by game and nongame wildlife. Pastures and forested areas provide habitat for a variety of mammals, birds, crustaceans, and reptiles.

FrA—Franeau clay, 0 to 1 percent slopes, occasionally flooded, tidal

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas
Major land resource area: 150A
Geomorphic setting: Tidal plain
Elevation: 0 to 7 feet (0 to 2 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Franeau and similar soils: 85 percent
Contrasting soils: Included with this soil in mapping are small areas of Beaumont, Caplen, Harris, Leton, and Meaton soils and soils like Franeau except they have a loamy surface, or are more saline. The Caplen and Harris soils are in lower positions. The Beaumont, Labelle, League, and Meaton soils are on higher positions. The Leton soils are loamy throughout and in depressional positions.

Component Description

Component geomorphic setting: Plain
Parent material: Clayey sediments of the Beaumont Formation
Typical vegetation: Gulf cordgrass, switchgrass, marshhay cordgrass, longspike tridens, bushy sea-oxeye

Typical Profile

Surface layer:
0 to 4 inches; slightly acid, very slightly saline, black clay
Subsurface layer:
4 to 16 inches; slightly acid, very slightly saline, black clay

Subsoil:

16 to 21 inches; slightly acid, very slightly saline, very dark gray clay
21 to 27 inches; neutral, slightly saline, very dark gray clay with brown mottles
27 to 61 inches; neutral, slightly saline, gray clay with yellow mottles
61 to 80 inches; moderately alkaline, slightly saline, gray clay with yellow mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Saline within 40 inches
Sodicity: Sodic within 40 inches
Available water capacity: About 6.1 inches (Moderate)

Component Hydrologic Properties

Natural drainage class: Poorly drained
Runoff: High
Annual flooding: Occasionally flooded for very brief periods by runoff from the uplands and storm tides throughout the year
Annual ponding: Not ponded
Seasonal high water table: A water table occurs from the surface to a depth of 1.5 feet from September through May

Interpretive Groups

Land capability nonirrigated: 6w
Land capability irrigated: Not assigned
Ecological site name: Salty Prairie

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in marsh. It is mainly used as rangeland and as habitat for wildlife. A few areas are cropped to rice. It is not suited to pasture or woodland because of salinity.

Crops grown on this soil are limited to rice production. The salinity of the soil is too high for other commonly grown crops. This soil is sticky when wet, hard when dry, and can become cloddy when plowed. The structure and tilth can be adversely affected when tilled when it is either too wet or too dry. Plowpans commonly occur in cultivated fields. Drainage systems that include proper row direction and field drains with adequate outlets are needed to remove excess surface water after rains. A good fertility program is needed for consistent high production.

Rice, grown as an irrigated crop, can be grown with acceptable yields in areas with good management. The main concern is the salinity of the soil and wetness. Management must be done to minimize the existing salinity and to avoid accumulating any more salinity, especially in the surface. Management of rice should include keeping the soil surface wet during the seedling stage and flooding the field as soon as possible to minimize the impact of salinity. It is naturally level and has a fairly uniform slope.

This soil is capable of producing high yields of marsh range grasses when properly managed. These areas are often utilized extensively by livestock in marsh pastures as bedding areas and refuge from floods and storms because they are drier and at a higher elevation than other marshes. As a result, these areas are often overgrazed and difficult to manage. Plant vigor can be maintained by proper stocking and by using a grazing rotation system. Prescribed burning also can be effectively used to help maintain plant vigor. Proper location of freshwater facilities and bedding areas for cattle also help achieve proper grazing.

Most urban uses are affected by soil properties. Clayey texture, flooding, and wetness require special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets.

The Franeau soil is used by game and nongame wildlife. The marsh provides habitat for a variety of mammals, birds, crustaceans, and reptiles.

HaA—Harris clay, 0 to 1 percent slopes, frequently flooded, tidal

Map Unit Setting

General location: Gulf Coast Marsh of Southeast Texas
Major land resource area: 151
Geomorphic setting: Intermediate marsh
Elevation: 0 to 7 feet (0 to 2 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Harris and similar soils: 80 percent
Contrasting soils: Included with this soil in mapping are small areas of Barnett, Creole, Franeau, and Veston soils and a soil similar to Harris except that it has a lighter surface color. The Barnett and Creole soils are more fluid throughout or in the lower part of the soil. The Franeau soils are less saline. The Veston soils are loamy throughout. The Franeau and Veston soils are on slightly higher positions.

Component Description

Component geomorphic setting: Tidal flat
Parent material: Firm clayey backswamp deposits
Typical vegetation: Marshhay cordgrass, common reed, seashore saltgrass

Typical Profile

Surface layer:
0 to 3 inches; very strongly acid, very slightly saline, very dark gray clay
3 to 22 inches; strongly acid, slightly saline, very dark gray clay with brown mottles
Subsoil:
22 to 55 inches; strongly acid, slightly saline, light gray clay with gray and brown mottles
Underlying material:
55 to 80 inches; strongly acid, slightly saline, light gray clay
A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Saline within 40 inches
Sodicity: Sodic within 40 inches
Available water capacity: About 4.6 inches (Low)

Component Hydrologic Properties

Natural drainage class: Very poorly drained
Runoff: High
Annual flooding: Frequently flooded for long periods by runoff from the uplands, unusually high spring tides, and storm tides throughout the year
Annual ponding: Not ponded
Seasonal high water table: A water table occurs from the surface to a depth of 2.5 feet from September through June

Interpretive Groups

Land capability nonirrigated: 7w
Land capability irrigated: Not assigned
Ecological site name: Firm Intermediate Marsh

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in marsh. It is mainly used as rangeland and as habitat for wildlife. It is not suited to crop production, pasture, or woodland because of salinity and wetness. Flooding is also a hazard.

This soil is capable of producing high yields of marsh range grasses when properly managed. Plant vigor can be maintained by proper stocking and by using a grazing rotation system. Prescribed burning also can be effectively used to help maintain plant vigor. Proper location of freshwater facilities and bedding areas for cattle also help achieve proper grazing.

Most urban uses are affected by soil properties. Clayey texture, flooding, and long periods of wetness does not allow septic systems to function properly without extensive modifications. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets.

The Harris soil is used by game and nongame wildlife. The marsh provides habitat for a variety of mammals, birds, crustaceans, gastropods, and reptiles.

ImA—Ijam clay, 0 to 2 percent slopes, frequently flooded, tidal

Map Unit Setting

General location: Gulf Coast Marsh of Southeast Texas
Major land resource area: 151
Geomorphic setting: Intermediate marsh
Elevation: 0 to 10 feet (0 to 3 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Ijam and similar soils: 80 percent
Contrasting soils: Included with this soil in mapping are areas of Neches and Neel soils. The Neches soils are sandy. The Neel soils are saline. Also included are areas of sandier soils, areas less frequently flooded, and areas with more than 2 percent slope.

Component Description

Component geomorphic setting: Tidal flat
Parent material: Firm clayey dredged sediments
Typical vegetation: Seashore paspalum, olney bulrush, marshhay cordgrass, coast cockspur, California bulrush

Typical Profile

Surface layer:
0 to 6 inches; very strongly acid, grayish brown clay
Underlying material:
6 to 23 inches; neutral, slightly saline, light brownish gray clay with yellow, brown, and gray mottles
23 to 65 inches; neutral, moderately saline, yellowish brown and light brownish gray clay with yellow and brown mottles
65 to 80 inches; neutral, moderately saline, light gray clay with yellow and gray mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 2 percent, the slope averages about 1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Saline within 40 inches
Sodicity: Sodic within 40 inches
Available water capacity: About 6.5 inches (Moderate)

Component Hydrologic Properties

Natural drainage class: Poorly drained
Runoff: Very high
Annual flooding: Frequently flooded for brief periods throughout the year
Annual ponding: Not ponded
Seasonal high water table: A water table occurs at the surface to a depth of 3.0 feet from September through June

Interpretive Groups

Land capability nonirrigated: 7w
Land capability irrigated: Not assigned
Ecological site name: Intermediate Marsh

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in marsh. It is mainly used as rangeland and urban related land. Many areas are still used as dredge spoil areas. This soil is not suited to crop production, pasture, or woodland because of salinity and flooding. Areas are variable in appearance depending on how long since the dredging operation has taken place. After the deposition of the dredge material, the soil is typically very boggy and saline and some areas are covered with water for some time. With time, the area becomes firm and less saline. The initial vegetation is somewhat variable depending on the position, salinity, and water table. As the salinity and water table becomes more stable, gulf cordgrass and other salt tolerant plants dominate the plant community.

This soil is capable of producing high yields of marsh range grasses when properly managed. Management may be difficult until these areas become stable with vegetation. These areas are often utilized extensively by livestock as bedding areas and refuge from floods and storms because they are drier and at a higher elevation than other marshes. As a result, areas are often overgrazed and difficult to manage. Plant vigor can be maintained by proper stocking and by using a grazing rotation system. Prescribed burning also can be effectively used to help maintain plant vigor. Proper location of freshwater facilities and bedding areas for cattle also help achieve proper grazing.

Most urban uses are affected by soil properties. Clayey texture, flooding, and wetness require special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets.

The Ijam soils are used by game and nongame wildlife. The marsh provides habitat for a variety of mammals and birds.

LaA—Labelle silt loam, 0 to 1 percent slopes

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas
Major land resource area: 150A
Geomorphic setting: Plain
Elevation: 7 to 49 feet (2 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Labelle and similar soils: 80 percent
Contrasting soils: Included with this soil in mapping are small areas of League, Meaton, Morey, and Spindletop soils. The League soils are clayey throughout and generally occur on slightly lower positions. The Meaton soils are wetter. The Morey and Spindletop soils are on higher positions. Also included are soils like Labelle that have a loamy subsoil in the upper part, have calcium carbonate in the subsoil, or have a light colored surface layer.

Component Description

Component geomorphic setting: Plain
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Big bluestem, little bluestem, yellow indiangrass, eastern gamagrass, switchgrass

Typical Profile

Surface layer:
0 to 6 inches; slightly acid, very dark gray silt loam with brown mottles

Subsoil:

6 to 12 inches; neutral, black silty clay loam with brown mottles

12 to 30 inches; neutral, very dark gray and dark gray silty clay with brown mottles

30 to 80 inches; slightly alkaline, gray silty clay with brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.2 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.2 inches (High)

Component Hydrologic Properties

Natural drainage class: Somewhat poorly drained
Runoff: High
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 0.5 to 1.5 from January through March

Interpretive Groups

Land capability nonirrigated: 3w
Land capability irrigated: 3w
Ecological site name: Loamy Prairie

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in prairie although forests have encroached in some areas. It is used as cropland, pasture, and rangeland. Rice is the main crop grown. This soil is used for rice production because it does not have much slope, it is very slowly permeable, and does not require much mechanical leveling.

Crops grown on this soil are responsive to good management. This soil is sticky when wet, hard when dry, and can become cloddy when plowed. The structure and tilth can be adversely affected when it is tilled too wet or too dry. Plowpans commonly occur in cultivated fields that can be detrimental to dryland crop production because roots cannot readily penetrate the pan to obtain moisture and nutrients. Drainage systems that include proper row direction and field drains with adequate outlets are needed to remove excess surface water after rains. A good fertility program is needed for consistent high production.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. Cool-season legumes produce winter forage while adding nitrogen to the soil.

Native range grasses, when properly managed, are capable of producing high yields on this soil. Soil wetness, caused by low surface runoff and a seasonal high water table, is a concern.

Most urban uses are affected by soil properties. Soil wetness, caused by low surface runoff and a seasonal high water table, is a concern. The clayey texture of the soil also requires special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

This Labelle soil is used by game and nongame wildlife. Pastures, cropland, and forested and native grass areas provide habitat for a variety of mammals, birds, crustaceans, and reptiles.

LbA—Labelle-Anahuac complex, 0 to 1 percent slopes

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas
Major land resource area: 150A
Geomorphic setting: Plain
Elevation: 7 to 49 feet (2 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Labelle soils: 55 percent
Anahuac soils: 35 percent
Contrasting soils: Included with these soils in mapping are areas of Leton and Spindletop soils. The Leton soils are loamy throughout. The Spindletop soils are on areas similar to Anahuac. Also included are soils similar to Labelle that have a lighter colored surface layer, are poorly drained, or have a natric horizon. The soils in this complex are so intricately mixed that it is not practical to separate them at the scale selected for mapping.

Labelle

Component Description

Component geomorphic setting: Plain.
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Big bluestem, little bluestem, yellow indiangrass, eastern gamagrass, switchgrass

Typical Profile

Surface layer:
0 to 5 inches; slightly acid, very dark gray silt loam
Subsurface horizon:
5 to 11 inches; slightly acid, very dark gray silt loam with brown mottles
Subsoil:
11 to 18 inches; slightly alkaline, very dark gray silty clay loam with brown mottles
18 to 23 inches; slightly alkaline, dark gray silty clay loam with gray and brown mottles
23 to 80 inches; slightly alkaline, light brownish gray to light gray clay with brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the overall slope averages about 0.2 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.5 inches (High)

Component Hydrologic Properties

Natural drainage class: Somewhat poorly drained
Runoff: High
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A water table occurs at a depth of 0.5 to 1.5 feet from January through March

Interpretive Groups

Land capability nonirrigated: 3w
Land capability irrigated: 3w
Ecological site name: Loamy Prairie

Anahuac

Component Description

Component geomorphic setting: Ridge
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Big bluestem, brownseed paspalum, little bluestem, yellow indiangrass, eastern gamagrass

Typical Profile

Surface layer:
0 to 10 inches; very strongly acid, very dark gray very fine sandy loam
Subsurface layer:
10 to 20 inches; very strongly acid, very dark grayish brown very fine sandy loam
20 to 26 inches; grayish brown very fine sandy loam
Subsoil:
26 to 56 inches; light brownish gray and light gray silty clay with brown mottles
56 to 80 inches; light gray silty clay with brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the overall slope averages about 0.2 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Sodic within 40 inches
Available water capacity: About 10.0 inches (High)

Component Hydrologic Properties

Natural drainage class: Moderately well drained
Runoff: Medium
Annual flooding: None
Annual ponding: Not ponded

Seasonal high water table: A perched water table may exist for a few days above the clayey subsoil in the winter months. A water table occurs at a depth of 4 to 6 feet from November through April.

Interpretive Groups

Land capability nonirrigated: 2w
Land capability irrigated: 2w
Ecological site name: Loamy Prairie

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in prairie. It is mainly used as pasture and rangeland. This area is marginally suited to normal crop production because of the many mounds present.

Crops grown on this complex need intensive management for efficient production. The major concern is the presence of mounds in the unit. This makes the surface uneven for efficient crop production. It is also difficult to reduce the wetness problem because the intricate pattern of mounds impedes drainage under cropped conditions. These soils also have somewhat less natural fertility than other commonly used cropland soils in the survey area. Also of concern is that the unit typically has a low pH. Normally only the edges of this complex are farmed when associated with other farmed areas. The Labelle part of the unit is slightly sticky when wet, hard when dry, and can become cloddy when plowed. Favorable soil structure and tilth can be maintained or improved by incorporating crop residue in the surface layer and tilling at the correct moisture content. Plowpans that restrict the downward movement of water and air may occur in this unit that can be detrimental to dryland crop production because roots cannot readily penetrate the pan to obtain moisture and nutrients. Drainage systems that are well planned are needed to remove excess surface water. This soil typically needs a liming program to increase the pH of the upper part of the soil for good production. A good fertility program is needed for consistent high production.

Rice, grown as an irrigated crop, is not suited in most places because of the uneven surface topography.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. The Anahuac soil areas provide dry bedding areas for livestock production. This soil complex is difficult to manage for optimum production without sacrificing management of one soil type or the other. Cool-season legumes produce winter forage while adding nitrogen to the soil.

Native range grasses, when properly managed, are capable of producing medium yields on this unit. Soil wetness, caused by slow surface runoff, is a concern. Good management should concentrate on establishment and maintenance of good plant vigor and growth on the Labelle soils. The Anahuac soils are difficult to manage for optimum production without sacrificing management of the Labelle soils.

Most urban uses are affected by soil properties. The clayey subsoils and the wetness of the Labelle soils require special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the Labelle soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

This complex is used by game and nongame wildlife. With management, this area can provide good habitat for a variety of mammals, birds, crustaceans, and reptiles.

LcA—Labelle-Aris complex, 0 to 1 percent slopes

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas
Major land resource area: 150A
Geomorphic setting: Plain
Elevation: 7 to 39 feet (2 to 12 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Labelle soils: 40 percent
Aris soils: 35 percent
Contrasting soils: Included with these soils in mapping are areas of Leton and Spindletop soils. The Leton soils are loamy throughout. The Spindletop soils are lighter colored and on higher positions. Also included are soils similar to Labelle that have a lighter colored surface layer, are poorly drained, or have a natric horizon.

Labelle

Component Description

Component geomorphic setting: Plain
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Big bluestem, little bluestem, yellow indiangrass, eastern gamagrass, switchgrass

Typical Profile

Surface layer:
0 to 12 inches; slightly acid, very dark gray silt loam
Subsoil:
12 to 18 inches; slightly alkaline, very dark gray silty clay loam
18 to 24 inches; slightly alkaline, dark gray clay with brown mottles
24 to 50 inches; slightly alkaline, gray clay with brown mottles
50 to 80 inches; slightly alkaline, light gray clay with brown and gray mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the overall slope averages about 0.2 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.4 inches (High)

Component Hydrologic Properties

Natural drainage class: Somewhat poorly drained
Runoff: High
Annual flooding: None

Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 0.5 to 1.5 feet from January through March

Interpretive Groups

Land capability nonirrigated: 3w
Land capability irrigated: 3w
Ecological site name: Loamy Prairie

Aris

Component Description

Component geomorphic setting: Depression
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Flatsedge, spikerush, Florida paspalum, maidencane, switchgrass

Typical Profile

Surface layer:
0 to 6 inches; strongly acid, dark gray fine sandy loam
Subsurface layer:
6 to 12 inches; strongly acid, dark gray fine sandy loam with brown mottles
Subsoil:
12 to 22 inches; strongly acid, gray silty clay loam with brown mottles
22 to 34 inches; strongly acid, light brownish gray silty clay loam and silt loam and brown and gray mottles
34 to 80 inches; strongly acid, light gray silty clay loam and silt loam with brown and gray mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the overall slope averages about 0.2 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 8.6 inches (Moderate)

Component Hydrologic Properties

Natural drainage class: Poorly drained
Runoff: Negligible
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs from the surface to a depth of 2.0 feet from November through March

Interpretive Groups

Land capability nonirrigated: 4w
Land capability irrigated: 4w
Ecological site name: Lowland

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in prairie. It is mainly used as pasture and rangeland. This area is marginally suited to normal crop production because of uneven surface topography.

Crops grown on this complex need intensive management for efficient production. The major concern is the presence of the depressional Aris soils. This makes the surface uneven for efficient crop production. It is also difficult to reduce the wetness problem because the intricate pattern of depressions impedes drainage under cropped conditions. Normally only the edges of this complex are farmed when associated with other farmed areas. The Labelle soil part of the unit is slightly sticky when wet, hard when dry, and can become cloddy when plowed. Favorable soil structure and tilth can be maintained or improved by incorporating crop residue in the surface layer and tilling at the correct moisture content. Plowpans that restrict the downward movement of water and air may occur in this unit and can be detrimental to dryland crop production because roots cannot readily penetrate the pan to obtain moisture and nutrients. Drainage systems that are well planned are needed to remove excess surface water. A good fertility program is needed for consistent high production.

Rice, grown as an irrigated crop, is not suited to this unit because of the surface topography.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. The unit is difficult to manage for optimum production without sacrificing management of one soil type or the other. Cool-season legumes produce winter forage while adding nitrogen to the soil.

Native range grasses, when properly managed, are capable of producing medium yields on this unit. The main concern is the wetness of the Aris soil because of the slow to ponded surface runoff. Good management should concentrate on establishment and maintenance of good plant vigor and growth in the Aris soil areas. The Aris soil areas are difficult to manage for optimum production without sacrificing management of the Labelle soil areas.

Most urban uses are affected by soil properties. The clayey subsoils require special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

This complex is used by game and nongame wildlife. With management, this area can provide good habitat for a variety of mammals, birds, crustaceans, and reptiles.

LdA—Labelle-Levac complex, 0 to 1 percent slopes

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas (fig. 9)
Major land resource area: 150A
Geomorphic setting: Plain
Elevation: 7 to 49 feet (2 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Figure 9.—Cropland area on Labelle-Levac complex, 0 to 1 percent slopes. The Levac soils are mounds that were leveled for rice production, and often appear as bare spots in a field. These soils are often saline and have low fertility.

Map Unit Composition

Labelle soils: 75 percent
Levac soils: 15 percent

Contrasting soils: Included with these soils in mapping are areas of League and Leton soils. The League soils are clayey throughout. The Leton soils are loamy throughout and occur in depressional areas. Also included are soils like Labelle that have lighter colored surface layers, have thicker surface layers, or have loamy subsoils in the upper part. Also included are soils similar to Levac that are more saline.

Labelle

Component Description

Component geomorphic setting: Plain
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Big bluestem, little bluestem, yellow indiangrass, eastern gamagrass, switchgrass

Typical Profile

Surface layer:
0 to 9 inches; neutral, very dark gray silt loam with brown mottles
Subsoil:
9 to 16 inches; neutral, very dark gray silty clay loam with brown mottles
16 to 36 inches; slightly alkaline, dark gray clay with brown mottles
36 to 80 inches; slightly alkaline, gray to light gray clay with brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.2 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.3 inches (High)

Component Hydrologic Properties

Natural drainage class: Somewhat poorly drained
Runoff: High
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 0.5 to 1.5 feet from January through March

Interpretive Groups

Land capability nonirrigated: 3w
Land capability irrigated: 3w
Ecological site name: Loamy Prairie

Levac

Component Description

Component geomorphic setting: Flat
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Big bluestem, little bluestem, yellow indiangrass, eastern gamagrass, switchgrass

Typical Profile

Surface layer:
- 0 to 5 inches; neutral, very dark grayish brown silt loam

Subsoil:
- 5 to 18 inches; moderately alkaline, grayish brown silty clay loam with brown mottles
- 18 to 34 inches; moderately alkaline, light brownish gray clay to silty clay with red, brown, and gray mottles
- 34 to 52 inches; moderately alkaline, light brownish gray silty clay with brown mottles
- 52 to 80 inches; moderately alkaline, light brownish gray silty clay with brown and red mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.2 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.0 inches (High)

Component Hydrologic Properties

Natural drainage class: Somewhat poorly drained
Runoff: High
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 0.5 to 1.5 feet from January through March

Interpretive Groups

Land capability nonirrigated: 3w
Land capability irrigated: 3w
Ecological site name: Loamy Prairie

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in prairie. It is used mainly as cropland and pasture. A few areas are in rangeland. Rice is the main crop grown.

Crops grown on this soil are responsive to good management. One of the major management concerns involves the elevated levels of salts or sodium that may occur in the upper part of the Levac soil where the mounds were located. In many years, these areas in cropland have elevated levels of salts or sodium that will stress or kill nonirrigated crops. Past management of the field influences the degree and extent of plant stress. In some cases, the upper part of these areas will become seasonally saline. This unit is slightly sticky when wet, hard when dry, and can become cloddy when plowed. Favorable soil structure and tilth can be maintained or improved by incorporating crop residue in the surface layer and tilling at the correct moisture content. A plowpan may form when this soil is cultivated. This decreases production of dryland crop production because roots cannot readily penetrate the pan to obtain moisture and nutrients. Drainage systems that include proper row direction and field drains with adequate outlets are needed to remove excess surface water after rains. A good fertility program is needed for consistent high production.

Rice, grown as an irrigated crop, has additional concerns. The primary concerns are associated with how uniformly water can be applied after the mounds have been smoothed. Production is related to maintaining a uniform flood depth. The presence of a plowpan is not a major concern when rice is grown because their roots do not need to penetrate the plowpan. Rice production can be used as a management tool to minimize the concentration of sodium and salinity that may occur where the mounds were located.

Pasture on this complex is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. Management that includes establishment and maintenance of good plant vigor and growth where the mounds were located increases the overall production of this soil unit. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. Cool-season legumes produce winter forage while adding nitrogen to the soil.

Native range grasses, when properly managed, are capable of producing high yields on this unit. Management that includes establishment and maintenance of good plant vigor and growth in the areas where the mounds occurred increases the overall production of this soil unit. Soil wetness, caused by of low surface runoff, is a concern.

Most urban uses are affected by soil properties. Wetness and clayey texture of these soils require special modifications and proper installation procedures so septic systems can function adequately. In addition, the low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

This complex is used by game and nongame wildlife. Prairie, cropland, and forested areas provide habitat for a variety of mammals, birds, crustaceans, and reptiles.

LeA—Labelle-Urban land complex, 0 to 1 percent slopes

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas
Major land resource area: 150A
Geomorphic setting: Urban
Elevation: 7 to 49 feet (2 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Labelle soils: 70 percent
Urban Land: 20 percent
Contrasting soils: Included with this soil in mapping are small areas of Anahuac and League soils. The Anahuac soils have a thicker surface layer. The League soils are clayey throughout.

Labelle

Component Description

Component geomorphic setting: Plain
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Big bluestem, little bluestem, yellow indiangrass, eastern gamagrass, switchgrass

Typical Profile

Surface layer:
0 to 6 inches; slightly acid, dark grayish brown silt clay loam with brown mottles
Subsoil:
6 to 12 inches; neutral, black silty clay loam with brown mottles
12 to 30 inches; neutral, very dark gray and dark gray silty clay with brown mottles
30 to 80 inches; slightly alkaline, gray silty clay with brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.2 inches (High)

Component Hydrologic Properties

Natural drainage class: Somewhat poorly drained
Runoff: High
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 0.5 to 1.5 feet from January through March

Interpretive Groups

Land capability nonirrigated: 3w
Land capability irrigated: 3w
Ecological site name: Loamy Prairie

Urban Land

Component Description

Component geomorphic setting: Urban sprawl
Parent material: Not described
Typical vegetation: Not described

The typical sequence, depth, and composition of the layers of the Urban Land consists of soils that have been altered or obscured by buildings or other structures making classification of the soils impractical. Typical structures are single and multiple unit dwellings, garages, sidewalks, driveways, streets, schools, churches, business buildings, shopping centers, office buildings, parking lots, and industrial sites.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Surface features: Manmade structures
Slowest permeability class in the soil profile: Slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: Not available

Component Hydrologic Properties

Natural drainage class: Not assigned
Runoff: Very high
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 8s
Land capability irrigated: Not assigned
Ecological site name: Not assigned

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Most urban uses are affected by soil properties. Soil wetness, caused by low surface runoff and a seasonal high water table, is a concern. The clayey texture of the subsoil also requires special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

LmA—Larose mucky peat, 0 to 1 percent slopes, frequently flooded

Map Unit Setting

General location: Gulf Coast Marsh of Southeast Texas
Major land resource area: 151
Geomorphic setting: Freshwater marsh
Elevation: 0 to 3 feet (0 to 1 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Larose soil and similar soils: 75 percent
Contrasting soils: Included with this soil in mapping are small areas of Barbary, Caplen, Estes, and Fausse soils. The Barbary soils are forested soils. The Caplen soils are more saline. The Estes and Fausse soils are not fluid soils.

Component Description

Component geomorphic setting: Marsh
Parent material: Fluid clayey backswamp deposits
Typical vegetation: Maidencane, bulltongue, alligatorweed, cattail, giant cutgrass

Typical Profile

Surface layer:
0 to 5 inches; strongly acid, very dark gray mucky peat
Subsurface layer:
5 to 9 inches; very strongly acid, very slightly saline, dark gray mucky clay
Underlying material:
9 to 22 inches; moderately acid, very slightly saline, dark gray fluid clay with gray mottles
22 to 80 inches; moderately acid, very slightly saline to slightly saline, gray and light gray fluid clay with gray and brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Saline within 40 inches
Sodicity: Sodic within 40 inches
Available water capacity: About 9.8 inches (High)

Component Hydrologic Properties

Natural drainage class: Very poorly drained
Runoff: Negligible
Annual flooding: Frequently flooded by runoff from uplands throughout the year

Annual ponding: Frequently ponded from the soil surface to 1 foot above the soil surface throughout the year.
Seasonal high water table: From the surface to a depth of more than 6.0 feet throughout the year

Interpretive Groups

Land capability nonirrigated: 8w
Land capability irrigated: Not assigned
Ecological site name: Fluid Fresh Marsh

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in marsh. It is mainly used as habitat for wildlife. It is not suited to crop production, pasture, rangeland, or woodland because of salinity, flooding, tidal inundation, and wetness. This soil will not support the weight of livestock under normal conditions.

This soil is capable of producing high yields of marsh range grasses when properly managed. Proper management on this soil includes practices that prevent the highly organic soil surface from burning, maintaining the delicate plant community, and maintaining plant vigor. This soil can be easily destroyed by improper burning, changes in drainage, salinity, or water table.

Most urban uses are affected by soil properties. Flooding and long periods of wetness does not allow septic systems to function properly without extensive modifications. In addition, the low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

The Larose soil is used by nongame wildlife. The marsh provides habitat for a variety of birds, crustaceans, and reptiles. This is also an important part of the marine estuary ecosystem by providing an abundant amount of detritus.

LtA—League clay, 0 to 1 percent slopes

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas
Major land resource area: 150A
Geomorphic setting: Plain
Elevation: 10 to 49 feet (3 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

League soil and similar soils: 85 percent
Contrasting soils: Included with this soil in mapping are small areas of Beaumont, China, and Labelle soils. The Beaumont soils are lighter colored and in lower positions. The China soils also have a gypsic horizon and are on similar positions. The Labelle soils have a loamy surface and are on higher positions. Also included are areas similar to League that have a lighter surface color.

Component Description

Component geomorphic setting: Plain

Parent material: Clayey sediments of the Beaumont Formation
Typical vegetation: Big bluestem, little bluestem, yellow indiangrass, eastern gamagrass, switchgrass

Typical Profile

Surface layer:
0 to 6 inches; very strongly acid, dark gray clay with brown mottles
Subsurface Layer:
6 to 11 inches; very strongly acid, very dark gray clay with brown mottles
Subsoil:
11 to 30 inches; very strongly acid, very dark gray clay with brown mottles
30 to 36 inches; very strongly acid, dark gray clay with brown mottles
36 to 46 inches; strongly acid, gray clay with gray and brown mottles
46 to 59 inches; slightly acid, gray clay with yellow mottles
59 to 80 inches; neutral, gray clay with yellow and brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 8.9 inches (Moderate)

Component Hydrologic Properties

Natural drainage class: Somewhat poorly drained
Runoff: High
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 0.5 to 1 foot from January through March

Interpretive Groups

Land capability nonirrigated: 3w
Land capability irrigated: 3w
Ecological site name: Blackland

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in prairie although forests have encroached in some areas. It is used as cropland, pasture, and rangeland. Rice is the main crop grown. Some small grains are also grown.

Crops grown on this soil are responsive to good management. This soil is sticky when wet, hard when dry, and can become cloddy when plowed. Although producers have equipment to till these soils, the structure and tilth can be adversely affected when tilled when it is too wet or too dry. Plowpans commonly occur in cultivated fields that can be detrimental to dryland crop production because roots cannot readily penetrate the pan to obtain moisture and nutrients. Drainage systems that include proper row direction and field drains with adequate outlets are needed to remove excess surface water after rains. A good fertility program is needed for consistent high production.

Rice, grown as an irrigated crop, does not have major concerns. It is extensively grown because the soil is naturally level and has a fairly uniform slope.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. Cool-season legumes produce winter forage while adding nitrogen to the soil.

Native range grasses, when properly managed, are capable of producing high yields on this soil. Soil wetness, caused by slow surface runoff and and a seasonal high water table, is a concern.

Most urban uses are affected by soil properties. Soil wetness, caused by slow surface runoff and a seasonal high water table, is a concern. The clayey texture of the soil also requires special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

The League soil is used by game and nongame wildlife. Pastures, cropland, and forested and native grass areas provide habitat for a variety of mammals, birds, crustaceans, and reptiles.

LuA—League-Urban land complex, 0 to 1 percent slopes

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas (fig. 10)
Major land resource area: 150A
Geomorphic setting: Urban
Elevation: 10 to 49 feet (3 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

League soils: 70 percent
Urban Land: 20 percent
Contrasting soils: Included with this soil in mapping are small areas of Beaumont, China, and Labelle soils. The Beaumont soils are wetter and have a lighter surface color. The China soils have a gypsic horizon and are on similar positions. The Labelle soils have a loamy surface and are on higher positions.

League

Component Description

Component geomorphic setting: Plain
Parent material: Clayey sediments of the Beaumont Formation
Typical vegetation: Big bluestem, little bluestem, yellow indiangrass, eastern gamagrass, switchgrass

Typical Profile

Surface layer:
0 to 6 inches; very strongly acid, dark gray clay with brown mottles
Subsurface layer:
6 to 11 inches; very strongly acid, very dark gray clay with brown mottles

Figure 10.—An oil tank farm associated with the oil refining industry. The area is in League-Urban land complex, 0 to 1 percent slopes.

Subsoil:
11 to 30 inches; very strongly acid, very dark gray clay with brown mottles
30 to 36 inches; very strongly acid, dark gray clay with brown mottles
36 to 46 inches; strongly acid, gray clay with gray and brown mottles
46 to 59 inches; slightly acid, gray clay with yellow mottles
59 to 80 inches; neutral, gray clay with yellow and brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 8.9 inches (Moderate)

Component Hydrologic Properties

Natural drainage class: Somewhat poorly drained
Runoff: High
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 0.5 to 1 foot from January through March

Interpretive Groups

Land capability nonirrigated: 3w
Land capability irrigated: 3w
Ecological site name: Blackland

Urban Land

Component Description

Component geomorphic setting: Urban sprawl
Parent material: Not described
Typical vegetation: Not described

Urban Land consists of soils that have been altered or obscured by buildings or other structures making classification of the soils impractical. Typical structures are single and multiple unit dwellings, garages, sidewalks, driveways, streets, schools, churches, business buildings, shopping centers, office buildings, parking lots, and industrial sites.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About (Very low)

Component Hydrologic Properties

Natural drainage class: Not assigned
Runoff: Very high
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 8s
Land capability irrigated: Not assigned
Ecological site name: Not assigned

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Most urban uses are affected by soil properties. Soil wetness, caused by low surface runoff and a seasonal high water table, is a concern. The clayey texture of the soil also requires special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

LvA—Leerco muck, 0 to 1 percent slopes, frequently flooded, tidal

Map Unit Setting

General location: Gulf Coast Marsh of Southeast Texas
Major land resource area: 151
Geomorphic setting: Intermediate marsh
Elevation: 0 to 3 feet (0 to 1 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)

Frost-free period: 260 to 310 days

Map Unit Composition

Leerco soil and similar soils: 75 percent
Contrasting soils: Included with this soil in mapping are small areas of Caplen, Creole, and Harris soils. The Caplen soils are more fluid. The Creole soils are more saline. The Harris soils are less fluid.

Component Description

Component geomorphic setting: Marsh
Parent material: Fluid clayey backswamp deposits
Typical vegetation: Marshhay cordgrass, seashore paspalum, coast cockspur, California bulrush, olney bulrush

Typical Profile

Surface layer:
0 to 5 inches; moderately acid, very slightly saline, black muck
Subsurface layer:
5 to 14 inches; moderately acid, slightly saline, very dark gray mucky clay
Underlying material:
14 to 26 inches; moderately acid, slightly saline, gray fluid clay with gray mottles
26 to 34 inches; strongly acid, moderately saline, gray fluid clay with gray and brown mottles
34 to 80 inches; moderately acid, moderately saline, gray fluid clay with black and gray mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 10.4 inches (High)

Component Hydrologic Properties

Natural drainage class: Very poorly drained
Runoff: Negligible
Annual flooding: Frequently flooded by runoff from uplands throughout the year and from high tides
Annual ponding: Frequently ponded for very long periods throughout the year
Seasonal high water table: A water table occurs from the surface to more than 6.0 feet throughout the year

Interpretive Groups

Land capability nonirrigated: 7w
Land capability irrigated: Not assigned
Ecological site name: Firm Intermediate Marsh

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in marsh. It is mainly used as habitat for wildlife. It is not suited to crop production, pasture, rangeland, or forestland because of salinity, flooding, tidal inundation, and wetness. Although the soil is fluid, it will support the weight of livestock because of the vegetative cover.

This soil is capable of producing high yields of marsh range grasses when properly managed. Proper management on this soil includes practices that prevent the highly organic soil surface from burning, maintaining the delicate plant community, and maintaining plant vigor. This soil can be easily destroyed by improper burning, changes in drainage, salinity, or water table.

Most urban uses are affected by soil properties. Flooding and long periods of wetness does not allow septic systems to function properly without extensive modifications. In addition, the low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

The Leerco soil is used by game and nongame wildlife. The marsh provides habitat for a variety of birds, crustaceans, and reptiles. This is also an important part of the marine estuary ecosystem by providing an abundant amount of detritus.

LwA—Leton loam, 0 to 1 percent slopes, ponded

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas (fig. 11)
Major land resource area: 150A
Geomorphic setting: Meander channel
Elevation: 7 to 39 feet (2 to 12 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Leton soil and similar soils: 75 percent
Contrasting soils: Included with this soil in mapping are small areas of Aris soils. The Aris soils are on similar positions.

Component Description

Component geomorphic setting: Meandering channel
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Maidencane, spikerush, Florida paspalum, switchgrass, eastern gamagrass

Typical Profile

Surface layer:
0 to 4 inches; extremely acid, dark grayish brown loam
Subsurface layer:
4 to 8 inches; extremely acid, dark gray loam
8 to 20 inches; ultra acid, dark gray loam with gray mottles
Subsoil:
20 to 34 inches; ultra acid, gray silty clay loam with gray mottles
34 to 80 inches; extremely acid, gray silty clay loam with brown and gray mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Figure 11.—Rangeland dominated by maidencane and arrowhead. The soil is Leton loam, 0 to 1 percent slopes, ponded, and is in the Firm Fresh Marsh Ecological Site.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 10.6 inches (High)

Component Hydrologic Properties

Natural drainage class: Poorly drained
Runoff: Negligible
Annual flooding: Occasionally flooded from uplands from October through May
Annual ponding: Not ponded
Seasonal high water table: A water table occurs at the surface to a depth of 1.5 feet from October through May

Interpretive Groups

Land capability nonirrigated: 4w
Land capability irrigated: Not assigned
Ecological site name: Lowland

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in prairie. It is used as cropland and pasture. A few areas are in rangeland. Rice is the main crop grown. This soil is used for rice production because it has little slope and is relatively easy to maintain an even flood depth.

Typically this soil is a narrow area that is lower than the surrounding soils, so some areas are used for drainage.

Crops grown on this soil are responsive to good management. This soil remains wet for extended periods of time after rains unless good drainage is present. This soil is hard when dry, and can become cloddy when plowed. Soil structure and tilth can be adversely affected when tilled when it is too wet or too dry. This soil is more subject to flooding and wetness than adjacent soils because it receives additional runoff water from the adjoining soils. Many areas have drainage ditches installed. These ditches effectively remove much of the wetness in the immediate area.

Rice, grown as an irrigated crop, does not have major concerns. This soil is farmed to rice because it is naturally level and has a fairly uniform slope although areas are long and narrow.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A well-designed drainage system is needed, if it does not already exist, to remove excess water following rains. A grazing management system and proper use of fertilizer increases forage yields and improves quality.

Native range grasses, when properly managed, are capable of producing high yields on this soil. Soil wetness, caused by low surface runoff and a seasonal high water table, is a concern.

Most urban uses are affected by soil properties. Soil wetness, caused by low surface runoff and a seasonal high water table, is a concern. The wetness of the soil also requires special modifications and proper installation procedures so septic systems can function adequately. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

The Leton soil is used by game and nongame wildlife. Pastures, cropland, and native grass areas provide habitat for a variety of mammals, birds, crustaceans, and reptiles.

McA—Meaton-Levac complex, 0 to 1 percent slopes, occasionally flooded, tidal

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas
Major land resource area: 150A
Geomorphic setting: Plain
Elevation: 3 to 30 feet (1 to 9 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Meaton soils: 75 percent
Levac soils: 15 percent
Contrasting soils: Included with these soils in mapping are areas of Labelle, League, and Leton soils. The Labelle soils are dryer. The League soils are clayey throughout. The Leton soils occur in depressional areas. Also included are soils similar to Meaton that have a lighter colored surface, have thicker surface layers, or have loamy subsoils in the upper part. These soils occur on similar landscapes. Also included are soils similar to Levac that are more saline or sodic.

Meaton

Component Description

Component geomorphic setting: Plain
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Switchgrass, Florida paspalum, little bluestem, eastern gamagrass, yellow indiangrass

Typical Profile

Surface layer:
0 to 5 inches; moderately acid, very dark gray silt loam
Subsoil:
5 to 14 inches; moderately acid, very dark gray silt loam with brown mottles
14 to 22 inches; moderately acid, gray silty clay loam with brown mottles
22 to 32 inches; moderately acid, gray silty clay loam with brown and gray mottles
32 to 76 inches; neutral, gray silty clay loam with yellow and gray mottles
76 to 80 inches; neutral, light brownish gray silty clay with yellow mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent
Surface features: Intermounds and flats
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 8.9 inches (Moderate)

Component Hydrologic Properties

Natural drainage class: Somewhat poorly drained
Runoff: Medium
Annual flooding: Occasionally flooded by runoff from storms in September and October
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 0.5 to 1.5 feet from January through March

Interpretive Groups

Land capability nonirrigated: 4w
Land capability irrigated: 4w
Ecological site name: Loamy Prairie

Levac

Component Description

Component geomorphic setting: Flat
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Big bluestem, little bluestem, yellow indiangrass, eastern gamagrass, switchgrass

Typical Profile

Surface layer:
0 to 4 inches; slightly acid, very dark grayish brown silt loam

Subsurface layer:

4 to 7 inches; slightly acid, dark grayish brown silt loam

7 to 11 inches; slightly acid, gray silt loam

Subsoil:

11 to 15 inches; neutral, dark grayish brown silt loam and clay loam with brown mottles

15 to 26 inches; slightly alkaline, grayish brown silty clay with brown mottles

26 to 80 inches; moderately alkaline, gray and light brownish gray silty clay with brown and red mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.2 percent
Surface features: Truncated mound
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.0 inches (High)

Component Hydrologic Properties

Natural drainage class: Somewhat poorly drained
Runoff: High
Flooding: Occasionally flooded by runoff from storms in September and October
Seasonal high water table: A perched water table occurs at a depth of 1 to 1.5 feet from January through March

Interpretive Groups

Land capability nonirrigated: 3w
Land capability irrigated: 3w
Ecological site name: Loamy Prairie

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this complex was in prairie. It is used mainly as cropland and pasture. A few areas are in rangeland. Rice is the main crop grown. Some small grains are also grown.

Crops grown on this soil are responsive to good management. One of the major management concerns involves the elevated levels of salts or sodium that may occur in the Levac soil areas. In many years, some areas of the Levac soils may have elevated levels of salts or sodium that will stress or kill nonirrigated crops. Past management of the field influences the degree and extent of plant stress. In some cases, the upper part of these areas will become seasonally saline. This unit is slightly sticky when wet, hard when dry, and can become cloddy when plowed. Favorable soil structure and tilth can be maintained or improved by incorporating crop residue into the surface layer and tilling at the correct moisture content. A plowpan may form when this soil is cultivated. This decreases dryland crop production because roots cannot readily penetrate the pan to obtain moisture and nutrients. Drainage systems that include proper row direction and field drains with adequate outlets are needed to remove excess surface water after rains. A good fertility program is needed for consistent high production.

Rice, grown as an irrigated crop, has additional concerns. The primary concerns are associated with how uniformly water can be applied after the mounds have been smoothed. Production is related to maintaining a uniform flood depth. The presence of a plowpan is not a major concern when rice is grown because their roots do not need to penetrate the plowpan. Rice production can be used as a management tool to minimize the concentration of sodium and salinity that may occur where the mounds were located.

Pasture on this complex is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. Management that includes establishment and maintenance of good plant vigor and growth where the mounds were located increases the overall production of this soil unit. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. Cool-season legumes produce winter forage while adding nitrogen to the soil.

Native range grasses, when properly managed, are capable of producing high yields on this unit. Management that includes establishment and maintenance of good plant vigor and growth in the areas where the mounds occurred increases the overall production of this soil unit. Soil wetness, caused by low surface runoff, is a concern.

Most urban uses are affected by soil properties. Wetness and clayey texture of these soils require special modifications and proper installation procedures so septic systems can function adequately. In addition, the low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

This complex is used by game and nongame wildlife. The prairie, cropland, and forested areas provide habitat for a variety of mammals, birds, crustaceans, and reptiles.

MeA—Meaton-Spindletop complex, 0 to 1 percent slopes, occasionally flooded, tidal

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas
Major land resource area: 150A
Geomorphic setting: Plain
Elevation: 3 to 30 feet (1 to 9 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Meaton soils: 60 percent
Spindletop soils: 20 percent
Contrasting soils: Included with these soils in mapping are areas of Anahuac, Labelle, and Leton soils. The Anahuac soils are more acid in the lower part of the subsoil and are on similar positions as Spindletop. The Labelle soils have clayey subsoils and are on similar positions to Meaton. The Leton soils are loamy throughout and are in depressional positions. Also included are soils similar to Meaton that have a lighter colored surface layer, are poorly drained, or have a natric horizon.

Meaton

Component Description

Component geomorphic setting: Plain
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Switchgrass, Florida paspalum, little bluestem, eastern gamagrass, yellow indiangrass

Typical Profile

Surface layer:
0 to 12 inches; moderately acid, very dark gray silt loam with brown and gray mottles
Subsoil:
12 to 22 inches; moderately acid, very dark gray silty clay loam with gray and brown mottles
22 to 37 inches; neutral, dark gray and gray silty clay loam with gray and brown mottles
37 to 80 inches; slightly alkaline, gray and light brownish gray silty clay loam and silty clay with yellow and gray mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the overall slope averages about 0.2 percent
Surface features: Intermound and flats
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Sodic within 40 inches
Available water capacity: About 9.3 inches (High)

Component Hydrologic Properties

Natural drainage class: Somewhat poorly drained
Runoff: Medium
Annual flooding: Occasionally flooded by runoff from storms in September and October
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at the surface to a depth of 1.5 feet from January through March

Interpretive Groups

Land capability nonirrigated: 4w
Land capability irrigated: 4w
Ecological site name: Loamy Prairie

Spindletop

Component Description

Component geomorphic setting: Pimple mounds
Parent material: Eolian loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Big bluestem, brownseed paspalum, little bluestem, yellow indiangrass, eastern gamagrass

Typical Profile

Surface layer:
0 to 12 inches; strongly acid, very dark gray silt loam
Subsurface layer:
12 to 21 inches; strongly acid, brown silt loam with brown mottles
21 to 28 inches; strongly acid, pale brown silt loam with brown mottles
28 to 35 inches; strongly acid, very pale brown silt loam with yellow mottles
Subsoil:
35 to 40 inches; slightly acid, brown silty clay loam and grayish brown loam with gray, yellow, and brown mottles
40 to 80 inches; slightly acid, gray to light gray clay with brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the overall slope averages about 0.2 percent
Surface features: Pimple mounds 2 to 3 feet high and 10 to 20 feet in diameter
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.8 inches (High)

Component Hydrologic Properties

Natural drainage class: Moderately well drained
Runoff: Medium
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 1.5 to 3.0 feet from January through March

Interpretive Groups

Land capability nonirrigated: 2w
Land capability irrigated: Not assigned
Ecological site name: Loamy Prairie

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically these soils were in prairie. The unit is mainly used as pasture and rangeland. Areas are marginally suited to normal crop production because of the many mounds present.

Crops grown on this complex need intensive management for efficient production. The major concern is the presence of mounds on the unit that make efficient crop production difficult. It is also difficult to reduce the wetness problem because the intricate pattern of mounds impedes drainage under cropped conditions. These soils have less natural fertility than other soils commonly used in cropland areas. Also of concern is that the unit typically has a low pH. Normally only the edges of these soil units are farmed when associated with other farmed areas. The Meaton soil part of the unit is slightly sticky when wet, hard when dry, and can become cloddy when plowed. Favorable soil structure and tilth can be maintained or improved by incorporating crop residue in the surface layer and tilling at the correct moisture content. Plowpans that restrict the downward movement of water and air may occur in this unit that can be detrimental to dryland crop production because roots cannot readily penetrate the pan to obtain moisture and nutrients. Drainage systems that are well planned are generally needed to remove excess surface water. This unit typically needs a liming program to increase the pH of the upper part of the soil for good production. A good fertility program is needed for consistent high production.

Rice, grown as an irrigated crop, is not suited to this unit because of the uneven surface topography.

Pasture on these soils is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. The unit is difficult to manage for optimum production without sacrificing management of the one soil type or the other. Cool-season legumes produce winter forage while adding nitrogen to the soil.

Native range grasses, when properly managed, are capable of producing medium yields on this unit. Good management should concentrate on establishment and maintenance of good plant vigor and growth in the Meaton areas. The Spindletop soil areas are difficult to manage for optimum production without sacrificing management of the Meaton soil areas. Soil wetness, caused by low surface runoff, is a concern.

Most urban uses are affected by soil properties. Soil wetness of the Meaton soil requires special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

This complex is used by game and nongame wildlife. With management, this area can provide good habitat for a variety of mammals, birds, crustaceans, and reptiles.

MmA—Mollco fine sandy loam, 0 to 1 percent slopes, ponded

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas
Major land resource area: 150A
Geomorphic setting: Strand plain
Elevation: 16 to 30 feet (5 to 9 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 68 to 70 degrees F (20 to 21 degrees C)
Frost-free period: 250 to 300 days

Map Unit Composition

Mollco soil and similar soils: 90 percent
Contrasting soils: Included in this mapping unit are areas of Craigen soils. The Craigen soils are on convex ridges and are better drained.

Component Description

Component geomorphic setting: Meandering channel
Parent material: Loamy sediments of the Beaumont Formation
Typical vegetation: Alabama supplejack, panicum, Carolina jessamine, bushy bluestem, sedges

Typical Profile

Surface layer:
0 to 3 inches; very strongly acid, dark grayish brown fine sandy loam

Subsurface layer:

3 to 16 inches; extremely acid, gray fine sandy loam with brown mottles in the upper part

Subsoil:

16 to 22 inches; extremely acid, gray sandy clay loam with gray mottles

22 to 38 inches; extremely acid, greenish gray sandy clay loam with brown and gray mottles

38 to 80 inches; extremely acid, gray sandy clay loam with brown and gray mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages 0.3 percent
Surface features: Concave meandering channel
Slowest permeability class in the soil profile: Moderately slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 8.5 inches (Moderate)

Component Hydrologic Properties

Natural drainage class: Very poorly drained
Runoff: Negligible
Annual flooding: Frequently flooded by runoff from uplands throughout the year
Annual ponding: Frequently ponded from the surface to 0.5 feet above the surface from October through May
Seasonal high water table: A water table occurs from the surface to more than 6 feet from October through May

Interpretive Groups

Land capability nonirrigated: 6w
Land capability irrigated: Not assigned
Ecological site name: Not assigned
Woodland productivity class: 280 board feet per acre

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in swamp. It is mainly used as woodland and wildlife land. This is a naturally forested site that consists mainly of a mixed stand of hardwood and some pine.

Woodland areas consist mainly of a hardwood forest. The commercial tree used for timber production is water oak. Wetness is the most limiting feature of this soil for production and harvesting of timber. The extended period of time that the soil is ponded and has a high water table restricts the use of equipment for most of the year. Seedling survival is severely impaired because of soil wetness. Using standard equipment with wheels or tracks on this soil causes rutting and compaction most of the year. Puddling makes unimproved roads and skid trails sticky, slick, and impassable. Woodland practices such as selective thinning and removal of undesirable trees should be carried out to maximize production.

Cropland production on this soil is not suited because of soil wetness.

Rice, grown as an irrigated crop, is also not suited to this soil because of soil wetness.

Pasture on this soil is responsive to good management but production is low because of soil wetness and flooding. Adapted native grasses should be managed. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality.

Most urban uses are affected by soil properties. Flooding and extended periods of wetness require special modifications and proper installation procedures so septic systems can function adequately. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

The Mollco soils are used by game and nongame wildlife. With management, this area can provide good habitat for a variety of mammals, birds, and reptiles.

MoA—Mollco-Craigen complex, 0 to 1 percent slopes

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas
Major land resource area: 150A
Geomorphic setting: Strand plain
Elevation: 16 to 30 feet (5 to 9 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 68 to 70 degrees F (20 to 21 degrees C)
Frost-free period: 250 to 300 days

Map Unit Composition

Mollco soils: 45 percent
Craigen soils: 40 percent
Contrasting soils: Included with these soils in mapping are areas of soils similar to Craigen soils that have thinner topsoil or have clayey subsoil.

Mollco

Component Description

Component geomorphic setting: Meandering channel
Parent material: Loamy sediments of the Beaumont Formation
Typical vegetation: Alabama supplejack, panicum, Carolina jessamine, bushy bluestem, sedges

Typical Profile

Surface layer:
0 to 5 inches; extremely acid, very dark grayish brown fine sandy loam
Subsurface layer:
5 to 14 inches; extremely acid, grayish brown fine sandy loam with brown mottles
Subsoil:
14 to 20 inches; extremely acid, gray fine sandy loam and sandy clay loam with gray and brown mottles
20 to 33 inches; extremely acid, dark gray clay loam and fine sandy loam with red and brown mottles
33 to 80 inches; extremely acid, gray clay loam, fine sandy loam and sandy clay loam with gray and red mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the overall slope averages about 0.2 percent
Surface features: Concave meandering channel
Slowest permeability class in the soil profile: Moderately slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 8.5 inches (Moderate)

Component Hydrologic Properties

Natural drainage class: Very poorly drained
Runoff: Negligible
Annual flooding: Frequently flooded by runoff from uplands throughout the year
Annual ponding: Frequently ponded from the surface to 0.5 feet above the surface from October to May
Seasonal high water table: A water table occurs from the surface to more than 6 feet from October through May

Interpretive Groups

Land capability nonirrigated: 6w
Land capability irrigated: Not assigned
Ecological site name: Not assigned
Woodland productivity class: 280 board feet per acre

Craigen

Component Description

Component geomorphic setting: Ridge
Parent material: Sandy sediment of the Beaumont Formation
Typical vegetation: Bluestems, panicums, longleaf uniola, yaupon, greenbrier

Typical Profile

Surface layer:
0 to 3 inches; very strongly acid, very dark grayish brown loamy fine sand
Subsurface layer:
3 to 18 inches; very strongly acid, brown loamy fine sand with gray and brown mottles
18 to 27 inches; very strongly acid, light brown loamy fine sand with brown and yellow mottles
Subsoil:
27 to 40 inches; very strongly acid, strong brown sandy clay loam with brown mottles
40 to 80 inches; very strongly acid, dark yellowish brown sandy clay loam and gray sand with brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the overall slope averages about 0.2 percent
Surface features: Meandering ridge
Slowest permeability class in the soil profile: Moderate
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 6.9 inches (Moderate)

Component Hydrologic Properties

Natural drainage class: Moderately well drained
Runoff: Negligible
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A water table occurs at a depth of 3.5 to 5 feet from November through April

Interpretive Groups

Land capability nonirrigated: 3s
Land capability irrigated: Not assigned
Ecological site name: Not assigned
Woodland productivity class: 330 board feet per acre

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this complex was in forest and marsh. It is mainly used as woodland and pasture.

Woodland areas consist mainly of a mixed pine and oak forest. Commercial trees used for timber production are loblolly pine on the Craigen soil and water oak on the Mollco soil. Wetness of the Mollco soil part of this complex is the most limiting feature of this unit for production and harvesting of timber. The seasonal high water table restricts the use of equipment for much of the year. Seedling survival of some species is affected in those years following extended wet periods. The seasonal high water table restricts root development. Trees occasionally are subject to windthrow during periods when the Mollco soil is wet. Using standard equipment with wheels or tracks on this soil causes rutting and compaction when the soil is wet. Puddling can occur during wet periods making unimproved roads and skid trails sticky, slick, and impassable. Woodland practices such as selective thinning and removal of undesirable trees should be carried out to maximize production.

Cropland on this complex is not suited because the Mollco soil is too wet for normal production.

Rice, grown as an irrigated crop, has many concerns to be feasible. The topography of the area is too complex to provide efficient water control over a large area and drainage is generally complex.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. Cool-season legumes produce winter forage while adding nitrogen to the soil.

Most urban uses are affected by soil properties. The wetness of the Mollco soil requires special modifications and proper installation procedures so septic systems can function adequately. In addition, the high leaching potential and low strength of the Craigen soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

This complex is used by game and nongame wildlife. With management, this area can provide habitat for a variety of mammals, birds, crustaceans, and reptiles.

MrA—Morey-Levac complex, 0 to 1 percent slopes

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas
Major land resource area: 150A
Geomorphic setting: Plain
Elevation: 7 to 49 feet (2 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Morey soils: 75 percent
Levac soils: 10 percent
Contrasting soils: Included with these soils in mapping are areas of Labelle and Leton soils. The Labelle soils are dark colored soils with clayey subsoils and are on positions similar to Morey. The Leton soils are light colored soils with loamy subsoils in depressional positions. Also included are soils like Morey that have a lighter colored surface or a thicker surface layer and are on similar positions.

Morey

Component Description

Component geomorphic setting: Plain
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Big bluestem, little bluestem, yellow indiangrass, eastern gamagrass, switchgrass

Typical Profile

Surface layer:
0 to 5 inches; neutral, very dark gray loam
Subsoil:
5 to 9 inches; neutral alkaline, very dark gray loam with brown mottles
9 to 26 inches; slightly alkaline, very dark gray clay loam with brown mottles
26 to 49 inches; moderately alkaline, dark gray clay loam with yellow, gray, and brown mottles
49 to 55 inches; moderately alkaline, grayish brown and gray clay loam with yellow and brown mottles
55 to 80 inches; moderately alkaline, light brownish gray clay loam with yellow mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.2 percent
Slowest permeability class in the soil profile: Slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.4 inches (High)

Component Hydrologic Properties

Natural drainage class: Somewhat poorly drained

Runoff: Medium
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 2.0 to 2.5 feet from December through February

Interpretive Groups

Land capability nonirrigated: 3w
Land capability irrigated: 3w
Ecological site name: Loamy Prairie

Levac

Component Description

Component geomorphic setting: Flat
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Big bluestem, little bluestem, yellow indiangrass, eastern gamagrass, switchgrass

Typical Profile

Surface layer:
0 to 5 inches; neutral, very dark grayish brown silt loam with brown mottles
Subsoil:
5 to 18 inches; moderately alkaline, grayish brown silty clay loam with brown mottles
18 to 34 inches; moderately alkaline, light brownish gray clay with brown and red mottles
34 to 52 inches; moderately alkaline, light brownish gray silty clay with brown mottles
52 to 80 inches; moderately alkaline, light brownish gray silty clay with red and brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.2 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.0 inches (High)

Component Hydrologic Properties

Natural drainage class: Somewhat poorly drained
Runoff: Medium
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 0.5 to 1.5 feet from January through March

Interpretive Groups

Land capability nonirrigated: 3w
Land capability irrigated: 3w
Ecological site name: Loamy Prairie

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this complex was in prairie. It is used mainly as cropland and pasture. A few areas are in rangeland. Rice is the main crop grown.

Crops grown on this soil are responsive to good management. One of the major management concerns involves the elevated levels of salts or sodium that may occur in the upper part of the Levac soil where the mounds were located. In many years, these elevated levels of salts or sodium will stress or kill nonirrigated crops. Past management of the field influences the degree and extent of plant stress. In some cases, the upper part of these areas becomes seasonally saline. This unit is slightly sticky when wet, hard when dry, and can become cloddy when plowed. Favorable soil structure and tilth can be maintained or improved by incorporating crop residue in the surface layer and tilling at the correct moisture content. A plowpan may form when this soil is cultivated. This decreases production of crops because roots cannot readily penetrate the pan to obtain moisture and nutrients. Drainage systems that include proper row direction and field drains with adequate outlets are needed to remove excess surface water after rains. A good fertility program is needed for consistent high production.

Rice, grown as an irrigated crop, has additional concerns. The primary concerns are associated with how uniformly water can be applied after the mounds have been smoothed. Production is related to maintaining a uniform flood depth. The presence of a plowpan is not a major concern when rice is grown since their roots do not need to penetrate the plowpan. Rice production can be used as a management tool to minimize the concentration of sodium and salinity that may occur where the mounds were located.

Pasture on this complex is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. Management that includes establishment and maintenance of good plant vigor and growth where the mounds were located increases the overall production of this soil unit. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. Cool-season legumes produce winter forage while adding nitrogen to the soil.

Native range grasses, when properly managed, are capable of producing high yields on this unit. Management that includes establishment and maintenance of good plant vigor and growth in the areas where the mounds occurred increases the overall production of this soil unit. Soil wetness, caused by low surface runoff, is a concern.

Most urban uses are affected by soil properties. Wetness and clayey texture of these soils require special modifications and proper installation procedures so septic systems can function adequately. In addition, the low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

This complex is used by game and nongame wildlife. The prairie, cropland, and forested areas provide habitat for a variety of mammals, birds, crustaceans, and reptiles.

MsA—Morey-Spindletop complex, 0 to 1 percent slopes

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas
Major land resource area: 150A

Geomorphic setting: Plain
Elevation: 7 to 49 feet (2 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Morey soils: 65 percent
Spindletop soils: 20 percent
Contrasting soils: Included with these soils in mapping are areas of Leton soils. The Leton soils are loamy throughout. Also included are soils similar to Morey that have a lighter surface color, are poorly drained, a thicker surface, or have a natric horizon.

Morey

Component Description

Component geomorphic setting: Plain
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Big bluestem, little bluestem, yellow indiangrass, eastern gamagrass, switchgrass

Typical Profile

Surface layer:
0 to 5 inches; neutral, very dark grayish brown silt loam
Subsurface layer:
5 to 10 inches; neutral, very dark grayish brown silt loam with brown mottles
Subsoil:
10 to 32 inches; slightly alkaline, dark grayish brown silty clay loam with brown mottles
32 to 80 inches; moderately alkaline, pinkish gray to light gray clay loam with brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the overall slope averages about 0.2 percent
Slowest permeability class in the soil profile: Slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.4 inches (High)

Component Hydrologic Properties

Natural drainage class: Somewhat poorly drained
Runoff: Medium
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 1.5 to 2.5 feet from December through February

Interpretive Groups

Land capability nonirrigated: 3w
Land capability irrigated: 3w

Ecological site name: Loamy Prairie

Spindletop

Component Description

Component geomorphic setting: Pimple mound
Parent material: Eolian loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Big bluestem, brownseed paspalum, little bluestem, yellow indiangrass, eastern gamagrass

Typical Profile

Surface layer:
0 to 12 inches; strongly acid, very dark gray silt loam
Subsurface layer:
12 to 25 inches; strongly acid to slightly acid, dark grayish brown to grayish brown silt loam with brown mottles
Subsoil:
25 to 29 inches; neutral, light brownish gray silty clay loam with brown mottles
29 to 80 inches; slightly alkaline, light brownish gray, gray, and light gray clay with red and brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the overall slope averages about 0.2 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.7 inches (High)

Component Hydrologic Properties

Natural drainage class: Moderately well drained
Runoff: Medium
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A water table occurs at a depth of 1.5 to 3 feet from January through March

Interpretive Groups

Land capability nonirrigated: 2w
Land capability irrigated: Not assigned
Ecological site name: Loamy Prairie

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in prairie. It is mainly used as pasture and rangeland. This area is marginally suited to normal crop production because of the many mounds present.

Crops grown on this complex need intensive management for efficient production. The major concern is the presence of mounds. This makes the surface uneven for efficient crop production. It is also difficult to reduce the wetness problem because the intricate pattern of mounds impedes drainage under cropped conditions. These soils also have somewhat less natural fertility than other commonly used cropland soils in the survey area. Also of concern is the Spindletop soils of the complex typically have a low pH in the upper layers. Normally only the edges of these soils are farmed when associated with other farmed areas. The Morey soils of the unit are slightly sticky when wet, hard when dry, and can become cloddy when plowed. Favorable soil structure and tilth can be maintained or improved by incorporating crop residue in the surface layer and tilling at the correct moisture content. Plowpans that restrict the downward movement of water and air may occur in this unit that can be detrimental to dryland crop production because roots cannot readily penetrate the pan to obtain moisture and nutrients. Drainage systems that are well planned are generally needed to remove excess surface water. This unit typically needs a liming program to increase the pH of the upper part of the soil for good production. A good fertility program is needed for consistent high production.

Rice, grown as an irrigated crop, is not suited to this unit because of the uneven surface topography.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. The Spindletop soil areas provide dry bedding areas for livestock production. The unit is difficult to manage for optimum production without sacrificing management of the one soil type or the other. Cool-season legumes produce winter forage while adding nitrogen to the soil.

Native range grasses, when properly managed, are capable of producing medium yields on this unit. Good management should concentrate on establishment and maintenance of good plant vigor and growth in the Morey soil areas. The Spindletop soil areas are difficult to manage for optimum production without sacrificing management of the Morey soil areas. Soil wetness, caused by slow surface runoff, is a concern.

Most urban uses are affected by soil properties. The clayey subsoils and the wetness of the Morey soil require special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the Morey soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

This complex is used by game and nongame wildlife. With management, this area provides good habitat for a variety of mammals, birds, crustaceans, and reptiles.

NcC—Neches coarse sand, 2 to 5 percent slopes

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas
Major land resource area: 150B
Geomorphic setting: Plain
Elevation: 7 to 26 feet (2 to 8 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Neches soil and similar soils: 80 percent
Contrasting soils: Included with this soil in mapping are areas of Ijam and Neel soils. The Ijam soils are clayey and wetter. The Neel soils are saline. Also included are areas of sand and areas with less than 2 percent slope.

Component Description

Component geomorphic setting: Plain
Parent material: Sandy to clayey stratified dredged sediments
Typical vegetation: Big bluestem, little bluestem, yellow indiangrass, eastern gamagrass, switchgrass

Typical Profile

Surface layer:
0 to 5 inches; slightly acid, brown coarse sand
Underlying material:
5 to 18 inches; slightly acid, brown coarse sand with gray clayey masses
18 to 36 inches; neutral, yellowish brown coarse sand with brown mottles and gray clayey strata
36 to 41 inches; neutral, pale brown coarse sand with brown and gray clay strata
41 to 45 inches; neutral, gray clay with red mottles and pale brown coarse sand strata
45 to 54 inches; neutral, pale brown coarse sand with red mottles and gray clay masses
54 to 80 inches; neutral, light brownish gray clay with brown coarse sand strata

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 2 to 5 percent, the slope averages about 2 percent
Slowest permeability class in the soil profile: Slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 5.9 inches (Low)

Component Hydrologic Properties

Natural drainage class: Well drained
Runoff: High
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 3w
Land capability irrigated: Not assigned
Ecological site name: Loamy Prairie

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

This Neches soil is mainly used as rangeland and urban related land. Many areas are still used as dredge spoil areas. These areas are variable in appearance depending on how long since the dredging operation has taken place. After the deposition of the dredge material, the soil is typically very boggy and saline and some areas may be covered with water for some time. With time, the area becomes firm and less saline. The initial vegetation is somewhat variable depending on the position, salinity, and water table. As the salinity and water table become more stable, the plant community stabilizes.

This soil is capable of producing high yields of range grasses when properly managed. Management is difficult until these areas become stable with vegetation. These areas are often utilized extensively by livestock as bedding areas and refuge from floods and storms because these soils are drier and at a higher elevation than other surrounding areas. As a result, these areas are often overgrazed and difficult to manage. Plant vigor can be maintained by proper stocking and by using a grazing rotation system. Prescribed burning also can be effectively used to help maintain plant vigor. Proper location of freshwater facilities and bedding areas for cattle also helps achieve proper grazing. In most cases, the original material is saline but because the soil is sandy and elevated above the surrounding area, the salt leach and nonsaline vegetation becomes dominant.

Most urban uses are affected by soil properties. Clayey texture in lower parts of the soil, and sandy surface require special modifications and proper installation procedures so septic systems can function adequately.

The Neches soil is used by game and nongame wildlife. This area provides habitat for a variety of mammals and birds.

NeA—Neel clay, 2 to 5 percent slopes, occasionally flooded, tidal

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas
Major land resource area: 151
Geomorphic setting: Plain
Elevation: 3 to 10 feet (1 to 3 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Neel soil and similar soils: 80 percent
Contrasting soils: Included with this soil in mapping are areas of Ijam and Neches soils. Also included are areas of sand and areas with less than 2 percent slope. The Ijam soils are wetter. The Neches soils are less clayey.

Component Description

Component geomorphic setting: Plain
Parent material: Clayey sediments of the Beaumont Formation
Typical vegetation: Gulf cordgrass, marshhay cordgrass, little bluestem, switchgrass, longspike tridens

Typical Profile

Surface layer:
0 to 12 inches; neutral, light brownish gray clay with brown, yellow, gray, and red mottles
Underlying material:
12 to 80 inches: slightly alkaline, very slightly saline to moderately saline, gray to light gray clay with olive, gray, red, and brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 2 to 5 percent, the slope averages about 3 percent
Slowest permeability class in the soil profile: Very slow

Salinity: Saline within 40 inches
Sodicity: Sodic within 40 inches
Available water capacity: About 6.5 inches (Moderate)

Component Hydrologic Properties

Natural drainage class: Moderately well drained
Runoff: Very high
Annual flooding: Occasionally flooded throughout the year
Annual ponding: Not ponded
Seasonal high water table: A water table occurs at a depth of 3.0 to 6.0 feet from September through May

Interpretive Groups

Land capability nonirrigated: 4s
Land capability irrigated: Not assigned
Ecological site name: Salty Prairie

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

This Neel soil is mainly used as rangeland and urban related land. Many areas are still used as dredge spoil areas. This area is not suited to crop production, pasture, or woodland because of salinity. These areas are variable in appearance depending on how long since the dredging operation has taken place. The original deposition of the dredge material had a variable salinity. With time, the areas become less saline. The initial vegetation is somewhat variable depending on the position, salinity, and water table. As the salinity and water table become more stable, gulf cordgrass and other salt tolerant plants dominate the plant community.

This soil is capable of producing high yields of marsh range grasses when properly managed. Management is difficult until these areas become stable with vegetation. These areas are often utilized extensively by livestock in marsh pastures as bedding areas and refuge from floods and storms because they are drier and at a higher elevation than other marshes. As a result, these areas are often overgrazed and difficult to manage. Plant vigor can be maintained by proper stocking and by using a grazing rotation system. Prescribed burning also can be effectively used to help maintain plant vigor. Proper location of freshwater facilities and bedding areas for cattle also help achieve proper grazing.

Most urban uses are affected by soil properties. Clayey texture, flooding, and wetness require special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets.

The Neel soil is used by game and nongame wildlife. The marsh provides habitat for a variety of mammals and birds.

NuC—Neel-Urban land complex, 2 to 5 percent slopes, rarely flooded, tidal

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas
Major land resource area: 151
Geomorphic setting: Urban
Elevation: 3 to 10 feet (1 to 3 meters)

Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Neel soils: 60 percent
Urban Land: 25 percent
Contrasting soils: Included with this complex in mapping are small areas of Ijam and League soils. The Ijam soils are wetter. The League soils are nonsaline.

Neel

Component Description

Component geomorphic setting: Plain
Parent material: Clayey sediments of the Beaumont Formation
Typical vegetation: Gulf cordgrass, marshhay cordgrass, little bluestem, switchgrass, longspike tridens

Typical Profile

Surface layer:
0 to 12 inches; neutral, light brownish gray clay with brown, yellow, gray, and red mottles
Underlying material:
12 to 80 inches: slightly alkaline, very slightly saline to moderately saline, gray to light gray clay with olive, brown, gray, and red mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 2 to 5 percent, the slope averages about 3 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Saline within 40 inches
Sodicity: Sodic within 40 inches
Available water capacity: About 6.5 inches (Moderate)

Component Hydrologic Properties

Natural drainage class: Moderately well drained
Runoff: Very high
Annual flooding: Rare
Annual ponding: Not ponded
Seasonal high water table: A water table occurs from a depth of 3.0 to 6.0 feet from September through May

Interpretive Groups

Land capability nonirrigated: 4s
Land capability irrigated: Not assigned
Ecological site name: Not assigned

Urban Land

Component Description

Component geomorphic setting: Urban sprawl
Parent material: Varied

Typical vegetation: Not described

The typical sequence, depth, and composition of the layers of the Urban Land consists of soils that have been altered or obscured by buildings or other structures making classification of the soils impractical. Typical structures are single and multiple unit dwellings, garages, sidewalks, driveways, streets, schools, churches, business buildings, shopping centers, office buildings, parking lots, and industrial sites.

Component Properties and Qualities

Slope: 2 to 5 percent
Slowest permeability class in the soil profile: Slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: Not described

Component Hydrologic Properties

Natural drainage class: Not assigned
Runoff: Very high
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 8s
Land capability irrigated: Not assigned
Ecological site name: Not assigned

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Most urban uses are affected by soil properties. Soil wetness, caused by a seasonal high water table, is a concern. The clayey texture of the subsoil also requires special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

OaB—Orcadia silt loam, 0 to 2 percent slopes

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas
Major land resource area: 150A
Geomorphic setting: Plain
Elevation: 7 to 49 feet (2 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Orcadia soil and similar soils: 85 percent

Contrasting soils: Included with this soil in mapping are small areas of Aris, Labelle, and Leton soils. The Aris soils are wetter and have a higher water table. The Labelle soils have a thinner surface layers and are in lower positions. The Leton soils have loamy subsoil and are in depressional areas.

Component Description

Component geomorphic setting: Ridge
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Big bluestem, brownseed paspalum, little bluestem, yellow indiangrass, eastern gamagrass

Typical Profile

Surface layer:
0 to 5 inches; very strongly acid, dark grayish brown silt loam with brown mottles
Subsurface layer:
5 to 10 inches; very strongly acid, grayish brown silt loam with brown mottles
Subsoil:
10 to 15 inches; very strongly acid, dark grayish brown silty clay loam and light brownish gray silt loam with brown mottles
15 to 45 inches; very strongly acid, dark gray to gray clay with red mottles
45 to 59 inches; strongly acid, gray clay with red and yellow mottles
59 to 70 inches; strongly acid, light brownish gray clay with red, yellow, and gray mottles
70 to 80 inches; very strongly acid, light brownish gray clay with brown and gray mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 2 percent, the slope averages about 0.3 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.3 inches (High)

Component Hydrologic Properties

Natural drainage class: Somewhat poorly drained
Runoff: Very high
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 0.8 to 1.5 feet from January through March

Interpretive Groups

Land capability nonirrigated: 3w
Land capability irrigated: Not assigned
Ecological site name: Loamy Prairie

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in prairie although forests have encroached in some areas. It is mainly used as cropland and pasture. It is not extensively used for rice production because it has a thick loamy surface, has too much slope in most areas, and is generally too high on the landscape for delivery of irrigation water to the area.

Crops grown on this soil are responsive to good management. Favorable soil structure and tilth can be maintained or improved by incorporating crop residue in the surface layer and tilling during the correct moisture content. This soil tends to be droughty and can become hard during prolonged dry periods in the summer. Wetness is not a significant problem in this soil when compared to many of the cropped soils in the survey area. Plowing, planting, and cultivating should be done in a timely manner to conserve moisture for the late spring and summer period. Proper row direction will help to remove surface water following heavy rains but caution should be used so soil erosion is not a problem. A liming program should be implemented to decrease the acidity of the soil whenever possible. This soil has less natural fertility than many of the other commonly cropped soils so a good fertility program is essential to obtaining high yields.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system and proper use of fertilizer increases forage yields and improves quality. Cool-season legumes produce winter forage while adding nitrogen to the soil.

Most urban uses are affected by soil properties. The high shrink-swell potential and low strength of the subsoil require some modifications and proper installation procedures so septic systems can function properly. In addition, these properties must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

The Orcadia soil is used by game and nongame wildlife. The prairie, cropland, and forested areas provide habitat for a variety of mammals, birds, and reptiles.

OcA—Orcadia-Anahuac complex, 0 to 1 percent slopes

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas (fig. 12)
Major land resource area: 150A
Geomorphic setting: Plain
Elevation: 7 to 49 feet (2 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Orcadia soils: 65 percent
Anahuac soils: 20 percent
Contrasting soils: Included with these soils in mapping are areas of Aris, Leton, and Texla soils. The Aris and Leton soils are in depressional areas. The Texla soils have loamy subsoils and are in slightly lower positions.

Orcadia

Component Description

Component geomorphic setting: Plain
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Big bluestem, brownseed paspalum, little bluestem, yellow indiangrass, eastern gamagrass

Figure 12.—An old rice field currently used as pasture. Major grasses are common bermudagrass and dallisgrass. The soils are in the Orcadia-Anahuac complex, 0 to 1 percent slopes.

Typical Profile

Surface layer:
0 to 8 inches; very strongly acid, dark grayish brown silt loam with brown mottles
Subsurface layer:
8 to 15 inches; very strongly acid, grayish brown silt loam with brown mottles
Subsoil:
15 to 18 inches; very strongly acid, dark grayish brown silty clay loam and silt loam with brown and gray mottles
18 to 44 inches; very strongly acid, dark grayish brown silty clay with gray and brown mottles
44 to 80 inches; very strongly acid, gray silty clay with gray and brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the overall slope averages about 0.2 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.4 inches (High)

Component Hydrologic Properties

Natural drainage class: Somewhat poorly drained
Runoff: High
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 0.8 to 1.5 feet from January through March

Interpretive Groups

Land capability nonirrigated: 3w
Land capability irrigated: Not assigned
Ecological site name: Loamy Prairie

Anahuac

Component Description

Component geomorphic setting: Ridge
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Big bluestem, brownseed paspalum, little bluestem, yellow indiangrass, eastern gamagrass

Typical Profile

Surface layer:
0 to 9 inches; very strongly acid, dark brown silt loam
Subsurface layer:
9 to 18 inches; strongly acid, dark brown loam with brown mottles
18 to 23 inches; strongly acid, brown silt loam with gray and yellow mottles
Subsoil:
23 to 27 inches; very strongly acid, brown silty clay and silt loam with brown mottles
27 to 56 inches; very strongly acid, gray silty clay with brown mottles
56 to 80 inches; strongly acid, gray to light gray silty clay with red, yellow, and brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the overall slope averages about 0.2 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 5.2 inches (Low)

Component Hydrologic Properties

Natural drainage class: Moderately well drained
Runoff: Medium
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table may exist for a few days above the clayey subsoil in the winter months. A water table occurs at a depth of 4.0 to 6.0 feet from November through April.

Interpretive Groups

Land capability nonirrigated: 2w
Land capability irrigated: 2w
Ecological site name: Loamy Prairie

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in prairie although forests have encroached in some areas. It is mainly used as pasture and rangeland. This area is marginally suited to normal crop production because of the many mounds present.

Crops grown on this complex need intensive management for efficient production. The major concern is the presence of mounds on the unit. This makes the surface uneven for efficient crop production. It is also difficult to reduce the wetness problem because the intricate pattern of mounds impedes drainage under cropped conditions. These soils also have somewhat less natural fertility than other commonly used cropland areas in the survey area. Also of concern is that the unit typically has a low pH. Normally only the edges of this complex are farmed when associated with other farmed areas. The Orcadia soils part of the unit is slightly sticky when wet, hard when dry, and can become cloddy when plowed. Favorable soil structure and tilth can be maintained or improved by incorporating crop residue in the surface layer and tilling at the correct moisture content. Plowpans that restrict the downward movement of water and air may occur in this unit and can be detrimental to dryland crop production because roots cannot readily penetrate the pan to obtain moisture and nutrients. Drainage systems that are well planned are generally needed to remove excess surface water. This unit typically needs a liming program to increase the pH of the upper part of the soil for good production. A good fertility program is needed for consistent high production.

Rice, grown as an irrigated crop, is not suited to this unit because of the uneven surface topography.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. The Anahuac soil areas provide dry bedding areas for livestock production. The unit is difficult to manage for optimum production without sacrificing management of one soil type or the other. Cool-season legumes produce winter forage while adding nitrogen to the soil.

Native range grasses, when properly managed, are capable of producing medium yields on this unit. Good management should concentrate on establishment and maintenance of good plant vigor and growth in the Orcadia soil areas. The Anahuac soil areas are difficult to manage for optimum production without sacrificing management of the Orcadia soil areas.

Most urban uses are affected by soil properties. The clayey subsoils and the wetness of the soils require special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the Orcadia soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

This complex is used by game and nongame wildlife. With management, this area can provide good habitat for a variety of mammals, birds, crustaceans, and reptiles.

OsA—Orcadia-Aris complex, 0 to 1 percent slopes

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas
Major land resource area: 150A
Geomorphic setting: Plain
Elevation: 7 to 49 feet (2 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Orcadia soils: 60 percent
Aris soils: 30 percent

Contrasting soils: Included with these soils in mapping are areas of Leton and Texla soils. The Leton soil has a loamy subsoil and occurs in depressions. The Texla soil is loamy throughout and occurs in slightly lower areas than Orcadia soils. Also included are soils similar to Orcadia soils that have a high water table and a soil similar to Aris soils that are somewhat poorly drained. Also included are soils similar to Orcadia soils on small mounds.

Orcadia

Component Description

Component geomorphic setting: Ridge
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Big bluestem, brownseed paspalum, little bluestem, yellow indiangrass, eastern gamagrass

Typical Profile

Surface layer:
0 to 9 inches; very strongly acid, dark grayish brown silt loam
Subsurface layer:
9 to 18 inches; very strongly acid, grayish brown silt loam with brown mottles
Subsoil:
18 to 23 inches; very strongly acid, pale brown silt loam with gray, brown, and yellow mottles
23 to 27 inches; very strongly acid, grayish brown silt loam and very fine sandy loam with gray mottles
27 to 70 inches; very strongly acid, gray clay with red, yellow, or brown mottles
70 to 80 inches; strongly acid, light gray clay with yellow mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the overall slope averages less than 1 percent
Slowest permeability class in the soil profile: Slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.7 inches (High)

Component Hydrologic Properties

Natural drainage class: Somewhat poorly drained
Runoff: Medium
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 0.8 to 1.5 feet from January through March

Interpretive Groups

Land capability nonirrigated: 3w
Land capability irrigated: Not assigned
Ecological site name: Loamy Prairie

Aris

Component Description

Component geomorphic setting: Depression
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Flatsedge, spikerush, Florida paspalum, maidencane, switchgrass

Typical Profile

Surface layer:
0 to 4 inches; very strongly acid, dark grayish brown silt loam with brown mottles
Subsurface layer:
4 to 10 inches; very strongly acid, light brownish gray silt loam
Subsoil:
10 to 48 inches; very strongly acid, grayish brown clay with brown and yellow mottles
48 to 80 inches; strongly acid, light brownish gray clay with brown and yellow mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the overall slope averages less than 1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 8.7 inches (Moderate)

Component Hydrologic Properties

Natural drainage class: Poorly drained
Runoff: Negligible
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs from the surface to a depth of 1.5 feet from November through March

Interpretive Groups

Land capability nonirrigated: 4w
Land capability irrigated: 4w
Ecological site name: Lowland

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in prairie although forests have encroached in some areas. It is used mainly as pasture. A few areas are in rangeland and cropland.

Crops grown on this complex are responsive to good management. The major concerns are the nonuniform slope, and that the Aris soils remain wet for extended periods of time following rains. Also of concern is that the Orcadia soils typically have a low pH. Normally only the edges of this complex are farmed when associated with other farmed areas. These soils are slightly sticky when wet, hard when dry, and can become cloddy when plowed. Favorable soil structure and tilth can be maintained or improved by incorporating crop residue in the surface layer and tilling at the correct moisture content. Plowpans that restrict the downward movement of water and air may occur in the Aris areas that can be detrimental to dryland crop production because roots cannot readily penetrate the pan to obtain moisture and nutrients. Drainage systems that are well planned are generally needed to remove excess surface water from the Aris areas after rains. This typically involves several relatively large field drains. The Orcadia soil areas need a liming program to increase the pH of the upper part of the soil for good production. A good fertility program is needed for consistent high production.

Rice, grown as an irrigated crop, generally has too many concerns to be feasible. Normally, only the edge of areas associated with other soil areas are used for rice production. The topography of the area is too complex to provide adequate water control over a large area, drainage is too complex to be practical, and a water delivery system is generally impractical by gravity flow.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. Cool-season legumes produce winter forage while adding nitrogen to the soil.

Native range grasses, when properly managed, are capable of producing medium yields on this unit. Good management that includes establishment and maintenance of good plant vigor and growth in the Aris soil areas increases the overall production of this soil unit. Soil wetness, caused by very slow to ponded surface runoff, is a concern.

Most urban uses are affected by soil properties. The clayey subsoils and the wetness of the Aris soil require special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

This complex is used by game and nongame wildlife. With management, this area can provide good habitat for a variety of mammals, birds, crustaceans, and reptiles.

OuA—Orcadia-Urban land complex, 0 to 2 percent slopes

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas
Major land resource area: 150A
Geomorphic setting: Urban
Elevation: 7 to 39 feet (2 to 12 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Orcadia soils: 60 percent
Urban Land: 30 percent
Contrasting soils: Included with this soil in mapping are small areas of Texla soils.
The Texla soils are loamy throughout and in slightly lower positions.

Orcadia

Component Description

Component geomorphic setting: Ridge

Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Big bluestem, brownseed paspalum, little bluestem, yellow indiangrass, eastern gamagrass

Typical Profile

Surface Layer:
0 to 5 inches; very strongly acid, dark grayish brown silt loam
Subsurface layer:
5 to 10 inches; strongly acid, dark brown silt loam
Subsoil:
10 to 15 inches; very strongly acid, dark grayish brown silty clay loam and light brownish gray silt loam with brown mottles
15 to 45 inches; very strongly acid, dark gray to gray clay with red mottles
45 to 59 inches; strongly acid, gray clay with red and yellow mottles
59 to 70 inches; strongly acid, light brownish gray clay with red and yellow mottles
70 to 80 inches; very strongly acid, light brownish gray clay with brown and gray mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 2 percent, the slope averages about 0.2 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.3 inches (High)

Component Hydrologic Properties

Natural drainage class: Somewhat poorly drained
Runoff: Very high
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 0.8 to 1.5 feet from January through March

Interpretive Groups

Land capability nonirrigated: 3w
Land capability irrigated: Not assigned
Ecological site name: Not assigned

Urban Land

Component Description

Component geomorphic setting: Urban sprawl
Parent material: Not described
Typical vegetation: Not described

The typical sequence, depth, and composition of the layers of the Urban Land consists of soils that have been altered or obscured by buildings or other structures making classification of the soils impractical. Typical structures are single and multiple unit dwellings, garages, sidewalks, driveways, streets, schools, churches, business buildings, shopping centers, office buildings, parking lots, and industrial sites.

Component Properties and Qualities

Slope: 0 to 2 percent, the slope averages about 0.2 percent
Slowest permeability class in the soil profile: Slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: Not described

Component Hydrologic Properties

Natural drainage class: Not assigned
Runoff: Very high
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 8s
Land capability irrigated: Not assigned
Ecological site name: Not assigned

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Most urban uses are affected by soil properties. Soil wetness, caused by low surface runoff, is a concern. The clayey texture of the subsoil also requires special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the subsoil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

Ow—Oil wasteland

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas
Major land resource area: 150A
Geomorphic setting: Varied
Elevation: 0 to 49 feet (0 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 68 to 72 degrees F (20 to 22 degrees C)
Frost-free period: 250 to 310 days

Map Unit Composition

This unit consists of areas where oil and sulfur related products have accumulated from drilling activities. It includes active or abandoned areas. The mapped areas range from 5 to several hundred acres.

Component Description

Component geomorphic setting: Varied
Typical vegetation: Not described

Component Properties and Qualities

Slope: 0 to 1 percent

Slowest permeability class in the soil profile: Slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: Not described

Component Hydrologic Properties

Natural drainage class: Well drained
Runoff: High
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 8s
Land capability irrigated: Not assigned
Ecological site name: Not assigned

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

This unit consists of areas where oil and sulfur related products have accumulated from drilling activities. It includes active or abandoned areas. The mapped areas range from 5 to several hundred acres.

Oil wasteland is not suitable for cropland, pasture, rangeland, or woodland. Most areas have existed for many years. These areas generally are difficult to reclaim.

Ps—Pits, sand

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas
Major land resource area: 150A
Geomorphic setting: Varied
Elevation: 7 to 49 feet (2 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 68 to 72 degrees F (20 to 22 degrees C)
Frost-free period: 250 to 310 days

Map Unit Composition

This unit consists of areas from which sand has been mined. The mapped areas range from 5 to 40 acres.

Component Description

Component geomorphic setting: Varied
Parent material: Not described
Typical vegetation: Not described

Component Properties and Qualities

Slope: 0 to 8 percent
Slowest permeability class in the soil profile: Slow
Salinity: Saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 3.5 inches (Low)

Component Hydrologic Properties

Natural drainage class: Well drained
Runoff: Not assigned
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: Not present within 80 inches

Interpretive Groups

Land capability nonirrigated: 8s
Land capability irrigated: Not assigned
Ecological site name: Not assigned

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Pits are not suitable for cropland, pasture, rangeland, or woodland. Some of the areas can be reclaimed and used as recreation areas, habitat for wildlife, or for water storage.

SbA—Sabine-Baines complex, 0 to 2 percent slopes, frequently flooded, tidal

Map Unit Setting

General location: Gulf Coast Marsh of Southeast Texas
Major land resource area: 151
Geomorphic setting: Brackish marsh
Elevation: 0 to 13 feet (0 to 4 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Sabine soils: 65 percent
Baines soils: 30 percent
Contrasting soils: Included with these soils in mapping are areas of Veston. The Veston soils are in higher positions than the Baines soil. Also included are soils similar to Sabine that have a thinner surface layer, lack a dark colored surface, and are more sandy throughout.

Sabine

Component Description

Component geomorphic setting: Beach ridge
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Switchgrass, little bluestem, gulfdune paspalum, brownseed paspalum, eastern gamagrass

Typical Profile

Surface layer:
0 to 7 inches; moderately acid, very dark gray loamy fine sand with brown mottles
Subsurface layer:

7 to 12 inches; moderately acid, very dark grayish brown loamy fine sand with brown mottles

Subsoil:

12 to 23 inches; moderately acid, brown loamy fine sand with brown mottles

23 to 37 inches; moderately acid, light yellowish brown loamy fine sand with gray and brown mottles

37 to 57 inches; slightly acid, light yellowish brown and light brownish gray loamy fine sand with brown mottles

57 to 80 inches; neutral, gray loamy fine sand with brown and red mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 2 percent, the overall slope averages about 0.2 percent
Slowest permeability class in the soil profile: Rapid
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 5.0 inches (Low)

Component Hydrologic Properties

Natural drainage class: Moderately well drained
Runoff: Negligible
Annual flooding: Occasionally flooded from storms from June through October
Annual ponding: Not ponded
Seasonal high water table: A water table occurs at a depth of 2.5 to 4.0 feet from September through May

Interpretive Groups

Land capability nonirrigated: 3s
Land capability irrigated: Not assigned
Ecological site name: Sandy Chenier

Baines

Component Description

Component geomorphic setting: Channel
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Seashore saltgrass, marshhay cordgrass, saltgrass bulrush, common reed, coast corkspur

Typical Profile

Surface layer:

0 to 12 inches; slightly alkaline, slightly saline, black clay

Subsurface layer:

12 to 33 inches; moderately alkaline, slightly saline, gray, grayish brown, and brown clay loam with brown mottles

33 to 48 inches; slightly alkaline, slightly saline, light brownish gray loamy fine sand with brown mottles

48 to 80 inches; slightly alkaline, slightly saline, strong brown, gray, and gray brown loamy fine sand

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the overall slope averages about 0.2 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 5.9 inches (Low)

Component Hydrologic Properties

Natural drainage class: Very poorly drained
Runoff: Negligible
Annual flooding: Frequently flooded by storms and high tides throughout the year
Annual ponding: Frequently ponded for very long periods throughout the year
Seasonal high water table: A water table occurs from the surface to a depth of 6 feet throughout the year

Interpretive Groups

Land capability nonirrigated: 7w
Land capability irrigated: Not assigned
Ecological site name: Firm Brackish Marsh

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in marsh. It is mainly used as range and urban land.

Cropland on this complex is generally not suited because the Baines soil is too wet and saline for normal production. However, small areas of the Sabine soil are used for a variety of crops that include vegetables and fruits.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass on the Sabine soil while the Baines soil is adapted to marsh range grasses. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. Cool-season legumes produce winter forage while adding nitrogen to the soil.

This soil is capable of producing high yields of marsh range grasses when properly managed. Plant vigor can be maintained by proper stocking and by using a grazing rotation system. This area is used extensively by livestock as bedding areas because the Sabine soil is relatively dry. The extensive use as bedding areas makes plant management difficult because it is easily overused. Prescribed burning also can be effectively used to help maintain plant vigor. Proper location of freshwater facilities and bedding areas for cattle also helps achieve proper grazing.

Most urban uses are affected by soil properties. The clayey subsoil and the wetness of the Baines soil require special modifications and proper installation procedures so septic systems can function adequately. In addition, the high leaching potential and low strength of the Sabine soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

This complex is used by game and nongame wildlife. With management, this area can provide habitat for a variety of mammals, birds, crustaceans, and reptiles.

ScA—Scatlake mucky clay, 0 to 1 percent slopes, very frequently flooded, tidal

Map Unit Setting

General location: Gulf Coast Marsh of Southeast Texas
Major land resource area: 151
Geomorphic setting: Saline marsh
Elevation: 0 to 3 feet (0 to 1 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 68 to 72 degrees F (20 to 22 degrees C)
Frost-free period: 250 to 310 days

Map Unit Composition

Scatlake soil and similar soils: 85 percent
Contrasting soils: Included with this soil in mapping are small areas of Bancker, Barnett, Creole, and Veston soils. All of these soils are less saline.

Component Description

Component geomorphic setting: Salt marsh
Parent material: Fluid clayey backswamp deposits
Typical vegetation: Smooth cordgrass, saltmarsh bulrush, needlegrass rush

Typical Profile

Surface layer:
0 to 8 inches; moderately acid, strongly saline, dark gray, very fluid, mucky clay
Underlying material:
8 to 34 inches; neutral, strongly saline, dark gray, very fluid clay
34 to 80 inches; neutral, strongly saline, gray, very fluid clay

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Slow
Salinity: Saline within 40 inches
Sodicity: Sodic within 40 inches
Available water capacity: About 5.9 inches (Low)

Component Hydrologic Properties

Natural drainage class: Very poorly drained
Runoff: Negligible
Annual flooding: This soil is very frequently flooded by runoff from the uplands, unusually high spring tides, and storm tides throughout the year
Annual ponding: Frequently ponded from the surface to 1 foot above the surface throughout the year
Seasonal high water table: A water table occurs from the surface to a depth of 6.0 feet throughout the year

Interpretive Groups

Land capability nonirrigated: 8w
Land capability irrigated: Not assigned
Ecological site name: Fluid Saline Marsh

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in marsh. It is mainly used as rangeland and as habitat for wildlife. It is not suited to crop production, pasture, or woodland because of salinity, wetness, and the fluid nature of the soil. This soil is very fluid which makes it unsuitable for general livestock grazing.

This soil is very susceptible to marsh erosion processes that allow the soil surface to be removed by water and alter the adapted plant community. The end result of this marsh erosion is typically barren areas. These areas are very difficult to revegetate. Increased flooding is also a hazard.

This soil is capable of producing medium yields of marsh range grasses when properly managed. The fluid nature of the soil makes it unsuitable for livestock grazing because it will not support the weight of livestock. Prescribed burning can be effectively used to help maintain plant vigor but extreme caution should be used to prevent marsh erosion by maintaining the organic soil surface.

Most urban uses are affected by soil properties. The fluid nature of the soil, clayey texture, flooding, and permanently saturated soil conditions does not allow septic systems to function properly without extensive modifications. In addition, the low strength of the soil must also be compensated for in the design and construction of buildings, roads, and streets.

This Scatlake soil is used by game and nongame wildlife. The marsh provides habitat for a variety of mammals, birds, crustaceans, gastropods, and reptiles. This is also an important part of the marine estuary ecosystem by providing an abundant amount of detritus.

SpA—Spurger loam, 0 to 2 percent slopes

Map Unit Setting

General location: Alluvial Terraces of Southeast Texas
Major land resource area: 152B
Geomorphic setting: Stream terrace
Elevation: 7 to 49 feet (2 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 68 to 70 degrees F (20 to 21 degrees C)
Frost-free period: 250 to 300 days

Map Unit Composition

Spurger soil and similar soils: 85 percent
Contrasting soils: Included with this soil in mapping are small areas of Bienville, Camptown, and Fausse. The Bienville soils have loamy subsoils and are on higher positions. The Camptown soils are loamy throughout and in lower positions. The Fausse soils are clayey throughout and in lower positions. Also included is a soil similar to Spurger that has loamy subsoil.

Component Description

Component geomorphic setting: Ridge
Parent material: Loamy and clayey sediments of the Deweyville Formation
Typical vegetation: Loblolly pine, American beautyberry, longleaf uniola, Carolina jessamine, yaupon, panicum

Typical Profile

Surface layer:
0 to 4 inches; strongly acid, dark grayish brown loam
Subsurface layer:
4 to 8 inches; strongly acid, brown loam
Subsoil:
8 to 16 inches; strongly acid, red clay with brown mottles
16 to 22 inches; strongly acid, reddish brown and reddish gray clay
22 to 40 inches; strongly acid, light brownish gray clay with red and brown mottles
40 to 50 inches; strongly acid, pale brown, light brownish gray, very pale brown, and strong brown clay
Underlying material:
50 to 80 inches; strongly acid, pale brown sandy clay loam, light brownish gray loamy fine sand, brownish yellow fine sandy loam, and yellowish red fine sandy loam

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 2 percent, the slope averages about 0.5 percent
Slowest permeability class in the soil profile: Slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 8.9 inches (Moderate)

Component Hydrologic Properties

Natural drainage class: Moderately well drained
Runoff: High
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A water table occurs at a depth of 5.0 to 6.0 feet from December through February

Interpretive Groups

Land capability nonirrigated: 3e
Land capability irrigated: Not assigned
Ecological site name: Not assigned
Woodland productivity class: 525 board feet per acre

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Woodland areas consist mainly of a mixed pine and hardwood forest. Commercial trees used for timber production are loblolly pine, southern red oak, and sweetgum. Wetness may be a problem when harvesting timber. Seedling survival of some species is affected in those years following extended wet periods. Using standard equipment with wheels or tracks on this soil causes rutting and compaction when the soil is wet. Puddling can occur during wet periods making unimproved roads and skid trails sticky, slick, and impassable. Woodland practices such as selective thinning and removal of undesirable trees should be carried out to maximize production.

Crops grown on this soil are responsive to good management. The major concern is unevenness of the surface and slope. These soils also have somewhat less natural fertility than other commonly used cropland in the survey area. This soil remains wet for some time following long periods of rain. Also of concern is that the unit typically has a low pH. Normally only the edges of these soil areas are farmed when associated with other farmed areas. This unit is hard when dry, and can become somewhat cloddy when plowed. Favorable soil structure and tilth can be maintained or improved by incorporating crop residue in the surface layer and tilling at the correct moisture content. This unit typically needs a liming program to increase the pH of the upper part of the soil for good production. A good fertility program is needed for consistent high production.

Rice, grown as an irrigated crop, is not suited to this soil because the slope is too steep.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. Liming may be needed to obtain good yields and quality. Cool-season legumes produce winter forage while adding nitrogen to the soil.

Most urban uses are affected by soil properties. The clayey subsoil and wetness require special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

The Spurger soils are used by game and nongame wildlife. With management, this area provides good habitat for a variety of mammals and birds.

StA—Spurger-Camptown complex, 0 to 1 percent slopes

Map Unit Setting

General location: Alluvial Terraces of Southeast Texas
Major land resource area: 152B
Geomorphic setting: Stream terrace
Elevation: 7 to 49 feet (2 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 68 to 70 degrees F (20 to 21 degrees C)
Frost-free period: 250 to 300 days

Map Unit Composition

Spurger and similar soils: 50 percent
Camptown soils: 35 percent
Contrasting soils: Included with these soils in mapping are areas of Bienville soils. The Bienville soils have sandy subsoils, have a thicker surface and occur on higher positions. Also included is a soil similar to Spurger that has loamy subsoil.

Spurger

Component Description

Component geomorphic setting: Ridge
Parent material: Loamy and clayey sediments of the Deweyville Formation
Typical vegetation: Loblolly pine, American beautyberry, longleaf uniola, Carolina jessamine, yaupon, panicum

Typical Profile

Surface layer:
0 to 8 inches; very strongly acid, brown loam with brown mottles in the lower part
Subsurface layer:
8 to 12 inches; very strongly acid, light brown loam
Subsoil:
12 to 23 inches; very strongly acid, dark red clay
23 to 34 inches; very strongly acid, yellowish red clay with gray mottles
34 to 43 inches; very strongly acid, yellowish red clay loam with brown and gray mottles
43 to 80 inches; very strongly acid, light brownish gray sandy clay loam with red mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the overall slope averages about 0.2 percent
Slowest permeability class in the soil profile: Slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.0 inches (Moderate)

Component Hydrologic Properties

Natural drainage class: Moderately well drained
Runoff: Medium
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A water table occurs at a depth of 5.0 to 6.0 feet from December through February

Interpretive Groups

Land capability nonirrigated: 3e
Land capability irrigated: Not assigned
Ecological site name: Not assigned
Woodland productivity class: 525 board feet per acre

Camptown

Component Description

Component geomorphic setting: Meandering channel
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Panicum, Alabama supplejack, Carolina jessamine, Pennsylvania smartweed

Typical Profile

Surface layer:
0 to 2 inches; very strongly acid, dark grayish brown loam
Subsurface layer:
2 to 7 inches; very strongly acid, light brownish gray loam
Subsoil:
7 to 23 inches; very strongly acid, grayish brown clay loam and light brownish gray loam with brown mottles

23 to 32 inches; very strongly acid, light brownish gray clay loam and gray silt loam with brown mottles
32 to 80 inches; very strongly acid, grayish brown clay with brown and red mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 8.0 inches (Moderate)

Component Hydrologic Properties

Natural drainage class: Very poorly drained
Runoff: Negligible
Annual flooding: None
Annual ponding: Frequently ponded from the soil surface to 1 foot above the soil surface from December through August
Season high water table: A water table occurs from the surface to a depth of 6.0 feet from December through August

Interpretive Groups

Land capability nonirrigated: 7w
Land capability irrigated: Not assigned
Ecological site name: Not assigned

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in forest. It is mainly used as woodland and pasture.

Woodland areas consist mainly of a mixed pine and oak forest. Commercial trees used for timber production are loblolly pine, southern red oak, and sweetgum on Spurger. Camptown soils are not considered to be commercially productive. Wetness of the Camptown soil is the most limiting feature of this soil for production and harvesting of timber. Trees occasionally are subject to windthrow during periods when the soil is wet. Using standard equipment with wheels or tracks on this soil causes rutting and compaction when the soil is wet. Puddling occurs on Camptown soils making unimproved roads and skid trails sticky, slick, and impassable. Woodland practices such as selective thinning and removal of undesirable trees should be carried out to maximize production.

Cropland on this complex needs intensive management for efficient production. The major concern is the uneven surface topography in the unit and wetness of the Camptown soil. These soils also have less natural fertility than other commonly used cropland areas in the survey area. The Camptown soils remain wet for extended periods of time. Also of concern is that the unit typically has a low pH. Favorable soil structure and tilth can be maintained or improved by incorporating crop residue in the surface layer and tilling at the correct moisture content. Plowpans that restrict the downward movement of water and air may occur in the soil that can be detrimental to dryland crop production because roots cannot readily penetrate the pan to obtain moisture and nutrients. Drainage systems that are well planned are generally needed to remove excess surface water from the Camptown areas after long periods of rain. This unit typically needs a liming program to increase the pH of the upper part of the soil for good production. A good fertility program is needed for consistent high production.

Rice, grown as an irrigated crop, generally has major concerns. The topography of the area is too complex to provide efficient water control over a large area and drainage patterns are complex.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass on the Spurger soil. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. Cool-season legumes produce winter forage while adding nitrogen to the soil.

Most urban uses are affected by soil properties. The clayey subsoil and the wetness of the Camptown soil require special modifications and proper installation procedures so septic systems can function adequately. In addition, the low strength of the Camptown soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

This complex is used by game and nongame wildlife. With management, this area can provide habitat for a variety of mammals, birds, crustaceans, and reptiles.

TaA—Texla silt loam, 0 to 1 percent slopes

Map Unit Setting

General location: Flatwoods of Southeast Texas (fig. 13)
Major land resource area: 152B
Geomorphic setting: Plain
Elevation: 20 to 59 feet (6 to 18 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 68 to 70 degrees F (20 to 21 degrees C)
Frost-free period: 250 to 300 days

Map Unit Composition

Texla soil and similar soils: 85 percent
Contrasting soils: Included with this soil in mapping are areas of Evadale and Gist soils. The Evadale soils have subsoils that are clayey in the upper part and wetter. The Gist soils are on mounds.

Component Description

Component geomorphic setting: Ridge
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Loblolly pine, Alabama supplejack, American beautyberry, spike uniola, longleaf uniola, yaupon

Typical Profile

Surface layer:
0 to 3 inches; very strongly acid, grayish brown silt loam with gray mottles
Subsurface layer:
3 to 8 inches; very strongly acid, light brownish gray silt loam with brown and yellow mottles
8 to 13 inches; extremely acid, light brownish gray silt loam with brown mottles
Subsoil:
13 to 21 inches; extremely acid, light brownish gray silt loam and silty clay loam with brown and red mottles

Figure 13.—Pine regenerating after harvesting on Texla silt loam, 0 to 1 percent slopes.

21 to 28 inches; very strongly acid, light brownish gray silty clay and gray and pale brown silt loam with brown and red mottles
28 to 58 inches; very strongly acid, light brownish gray silty clay and light gray silt loam with brown, red, and yellow mottles
58 to 80 inches; very strongly acid, light gray silty clay and light gray silt loam with yellow, brown, and red mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.2 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.2 inches (High)

Component Hydrologic Properties

Natural drainage class: Somewhat poorly drained
Runoff: High
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 0.5 to 1.5 feet January through March

Interpretive Groups

Land capability nonirrigated: 3w
Land capability irrigated: Not assigned
Ecological site name: Not assigned

Woodland productivity class: 330 board feet per acre

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in forest. It is used as woodland and native pasture. Some areas are cropped to rice.

Woodland areas consist of pine and hardwood. The commercial tree used for timber production is loblolly pine. Wetness is the most limiting feature of this soil for production and harvesting of timber. The seasonal high water table restricts the use of equipment to midsummer when the soil is dry. Also, the seasonal high water table restricts root development. Trees occasionally are subject to windthrow during periods when the soil is wet. Using standard equipment with wheels or tracks on this soil causes rutting and compaction when the soil is wet. Puddling can occur during wet periods making unimproved roads and skid trails sticky, slick, and impassable. Woodland practices such as selective thinning and removal of undesirable trees should be carried out to maximize production.

Crops grown on this soil are responsive to good management. This soil is slightly sticky when wet, hard when dry, and can become somewhat cloddy when plowed. The structure and tilth can be adversely affected when it is tilled too wet or too dry. Plowpans commonly occur in cultivated fields that can be detrimental to dryland crop production because roots cannot readily penetrate the pan to obtain moisture and nutrients. Drainage systems that include proper row direction and field drains with adequate outlets are needed to remove excess surface water after rains. A good fertility program is needed for consistent high production.

Rice, grown as an irrigated crop, does not have many additional concerns. It has a lower natural fertility level than soils commonly used for rice production. It is fairly level and generally has a uniform slope.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. Cool-season legumes produce winter forage while adding nitrogen to the soil.

Most urban uses are affected by soil properties. Soil wetness, caused by slow surface runoff and a seasonal high water table, is a concern. The texture in the lower part of the soil also requires special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

This Texla soil is used by game and nongame wildlife. Pastures, forests, and native grass areas provide habitat for a variety of mammals, birds, and crustaceans.

TeB—Texla-Evadale complex, 0 to 1 percent slopes

Map Unit Setting

General location: Flatwoods of Southeast Texas
Major land resource area: 152B
Geomorphic setting: Plain
Elevation: 10 to 59 feet (3 to 18 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 68 to 70 degrees F (20 to 21 degrees C)
Frost-free period: 250 to 300 days

Map Unit Composition

Texla and similar soils: 50 percent
Evadale and similar soils: 30 percent
Contrasting soils: Included with these soils in mapping are areas of Gist soils. The Gist soils occur on mounds. Also included are soils similar to Texla that are poorly drained or have clayey subsoils throughout. The soil similar to Texla that is poorly drained occurs in lower positions. The soil similar to Texla with clayey subsoil occurs on similar positions.

Texla

Component Description

Component geomorphic setting: Ridge
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Loblolly pine, Alabama supplejack, American beautyberry, spike uniola, longleaf uniola, yaupon

Typical Profile

Surface layer:
0 to 3 inches; very strongly acid, dark grayish brown silt loam
Subsurface layer:
3 to 6 inches; very strongly acid, gray and light gray silt loam
Subsoil:
6 to 13 inches; very strongly acid, gray silty clay loam and silt loam with gray and brown mottles
13 to 20 inches; very strongly acid, gray clay and silt loam with brown mottles
20 to 40 inches; very strongly acid, gray clay and silt loam with gray and brown mottles
40 to 80 inches; strongly acid, light gray clay with brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the overall slope averages about 0.2 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.0 inches (High)

Component Hydrologic Properties

Natural drainage class: Somewhat poorly drained
Runoff: High
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 0.5 to 1.5 feet from January through March

Interpretive Groups

Land capability nonirrigated: 3w
Land capability irrigated: Not assigned
Ecological site name: Not assigned
Woodland productivity class: 330 board feet per acre

Evadale

Component Description

Component geomorphic setting: Plain
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Alabama supplejack, sedges, Carolina jointtail, Carolina jessamine, spike uniola

Typical Profile

Surface layer:
0 to 5 inches; extremely acid, grayish brown silt loam with gray and brown mottles
Subsurface layer:
5 to 9 inches; extremely acid, grayish brown silt loam with gray and brown mottles
Subsoil:
9 to 30 inches; extremely acid, grayish brown clay loam with gray, yellow, and brown mottles
30 to 54 inches; extremely acid, light brownish gray clay with red and gray mottles
54 to 80 inches; extremely acid, light gray clay with yellow and red mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the overall slope averages about 0.2 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 10.8 inches (High)

Component Hydrologic Properties

Natural drainage class: Poorly drained
Runoff: High
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table exists from the surface to a depth of 1.5 feet from December through April

Interpretive Groups

Land capability nonirrigated: 4w
Land capability irrigated: Not assigned
Ecological site name: Not assigned
Woodland productivity class: 460 board feet per acre

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in forest. It is mainly used as woodland and pasture. A few areas were used for rice production in the past but few areas are used presently because it is not economical to farm these areas now.

Woodland areas consist mainly of a mixed pine and hardwood forest. Commercial trees used for timber production are loblolly pine and slash pine. Wetness is the most limiting feature of this complex for production and harvesting of timber. The seasonal high water table restricts the use of equipment for much of the year. Seedling survival of some species is affected in those years following extended wet periods. The seasonal high water table restricts root development. Trees occasionally are subject to windthrow during periods when the soil is wet. Using standard equipment with wheels or tracks on this soil causes rutting and compaction when the soil is wet. Puddling can occur during wet periods making unimproved roads and skid trails sticky, slick, and impassable. Woodland practices such as selective thinning and removal of undesirable trees should be carried out to maximize production.

Cropland on this complex needs intensive management for efficient production. The major concerns are the uneven surface topography and wetness. These soils also have somewhat less natural fertility than other commonly used cropland areas in the survey area. The complex remains wet for extended periods of time following rains. Also of concern is that the unit typically has a low pH. Favorable soil structure and tilth can be maintained or improved by incorporating crop residue in the surface layer and tilling at the correct moisture content. Plowpans that restrict the downward movement of water and air may occur in the soil that can be detrimental to dryland crop production because roots cannot readily penetrate the pan to obtain moisture and nutrients. Drainage systems that are well planned are needed to remove excess surface water from the area after long periods of rain. This unit typically needs a liming program to increase the pH of the upper part of the soil for good production. A good fertility program is needed for consistent high production.

Rice, grown as an irrigated crop, generally has major concerns to be feasible. Normally, only the edges of this complex associated with other soil areas are used for rice production. The topography of the area is too complex to provide efficient water control and drainage over a large area.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. Cool-season legumes produce winter forage while adding nitrogen to the soil.

Most urban uses are affected by soil properties. The clayey subsoils and wetness require special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

This complex is used by game and nongame wildlife. With management, this area can provide habitat for a variety of mammals, birds, crustaceans, and reptiles.

TgA—Texla-Gist complex, 0 to 1 percent slopes

Map Unit Setting

General location: Flatwoods of Southeast Texas (fig. 14)
Major land resource area: 152B
Geomorphic setting: Plain
Elevation: 20 to 59 feet (6 to 18 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 68 to 70 degrees F (20 to 21 degrees C)
Frost-free period: 250 to 300 days

Map Unit Composition

Texla soils and similar soils: 60 percent
Gist and similar soils: 15 percent

Figure 14.—Managed loblolly pine on an area of Texla-Gist complex, 0 to 1 percent slopes.

Contrasting soils: Included with these soils in mapping are areas of Evadale soils. The Evadale soils have clayey subsoils and are in depressional positions. Also included are soils similar to Texla soils that are poorly drained or have clayey subsoils throughout. The soil similar to Texla that is poorly drained occurs in slightly lower positions than Texla. The soil similar to Texla with clayey subsoil occurs on similar positions.

Texla

Component Description

Component geomorphic setting: Ridge
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Loblolly pine, Alabama supplejack, American beautyberry, spike uniola, longleaf uniola, yaupon

Typical Profile

Surface layer:
0 to 4 inches; very strongly acid, dark grayish brown silt loam with gray mottles
Subsurface layer:
4 to 9 inches; very strongly acid, light yellowish brown silt loam with gray mottles
Subsoil:
9 to 22 inches; very strongly acid, yellowish brown silty clay loam and pale brown silt loam with yellow and brown mottles
22 to 33 inches; very strongly acid, grayish brown clay with brown, red, and gray mottles
33 to 47 inches; very strongly acid, gray clay with red, brown, and gray mottles
47 to 80 inches; very strongly acid, light gray clay with olive, yellow and gray mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the overall slope averages about 0.2 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.1 inches (High)

Component Hydrologic Properties

Natural drainage class: Somewhat poorly drained
Runoff: High
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 0.5 to 1.5 feet from January through March

Interpretive Groups

Land capability nonirrigated: 3w
Land capability irrigated: Not assigned
Ecological site name: Not assigned
Woodland productivity class: 330 board feet per acre

Gist

Component Description

Component geomorphic setting: Pimple mounds
Parent material: Eolian loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Loblolly pine, Alabama supplejack, American beautyberry, spike uniola, longleaf uniola, yaupon

Typical Profile

Surface layer:
0 to 5 inches; extremely acid, dark grayish brown very fine sandy loam
Subsurface layer:
5 to 20 inches; extremely acid, pale brown very fine sandy loam
Subsoil:
20 to 28 inches; extremely acid, light yellowish brown, yellowish brown, and pale brown loam
28 to 38 inches; extremely acid, brownish yellow, yellowish brown, pale brown, and gray loam
38 to 50 inches; very strongly acid, yellowish brown, strong brown, and gray loam
50 to 60 inches; very strongly acid, grayish brown clay with red and brown mottles
60 to 80 inches; very strongly acid, light brownish gray and gray silty clay loam with red and brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the overall slope averages about 0.2 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches

Sodicity: Not sodic within 40 inches
Available water capacity: About 10.1 inches (High)

Component Hydrologic Properties

Natural drainage class: Moderately well drained
Runoff: High
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 2.0 to 4.0 feet from November through May

Interpretive Groups

Land capability nonirrigated: 2w
Land capability irrigated: Not assigned
Ecological site name: Not assigned
Woodland productivity class: 525 board feet per acre

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in forest. It is mainly used as woodland and pasture. A few areas were used for rice production in the past but few areas are used presently because it is not economical to farm these areas now.

Woodland areas consist mainly of a mixed pine and hardwood forest. Commercial trees used for timber production are loblolly pine, slash pine, and sweetgum. Wetness is the most limiting feature of this soil complex for production and harvesting of timber. The seasonal high water table restricts the use of equipment for much of the year. Seedling survival of some species is affected in those years following extended wet periods. The seasonal high water table restricts root development. Trees occasionally are subject to windthrow during periods when the soil is wet. Using standard equipment with wheels or tracks on this soil causes rutting and compaction when the soil is wet. Puddling can occur during wet periods making unimproved roads and skid trails sticky, slick, and impassable. Woodland practices such as selective thinning and removal of undesirable trees should be carried out to maximize production.

Cropland on this complex needs intensive management for efficient production. The major concern is the uneven surface topography and wetness. These soils also have somewhat less natural fertility than other commonly used cropland areas in the survey area. The Texla soils remain wet for extended periods of time following rains. Also of concern is that the unit typically has a low pH. Normally only the edges of this complex are farmed when associated with other farmed areas. Favorable soil structure and tilth can be maintained or improved by incorporating crop residue in the surface layer and tilling at the correct moisture content. Plowpans that restrict the downward movement of water and air may occur in the soil that can be detrimental to dryland crop production because roots cannot readily penetrate the pan to obtain moisture and nutrients. Drainage systems that are well planned are generally needed to remove excess surface water from the Texla soil areas after long periods of rain. This unit typically needs a liming program to increase the pH of the upper part of the soil for good production. A good fertility program is needed for consistent high production.

Rice, grown as an irrigated crop, generally has many concerns. Normally, only the edges of this complex associated with other soil areas are used for rice production. The topography of the area is too complex to provide efficient water control over a large area and drainage is complex.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. Cool-season legumes produce winter forage while adding nitrogen to the soil.

Most urban uses are affected by soil properties. The clayey subsoils and the wetness of the Texla soil require special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the Texla soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

This complex is used by game and nongame wildlife. With management, this area can provide habitat for a variety of mammals, birds, crustaceans, and reptiles.

VaA—Vamont clay, 0 to 2 percent slopes

Map Unit Setting

General location: Flatwoods of Southeast Texas
Major land resource area: 152B
Geomorphic setting: Plain
Elevation: 26 to 49 feet (8 to 15 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 68 to 70 degrees F (20 to 21 degrees C)
Frost-free period: 250 to 300 days

Map Unit Composition

Vamont soil and similar soils: 85 percent
Contrasting soils: Included with this soil in mapping are small areas of Bevil, Estes, Fausse, and Texla soils. The Bevil soils are on slightly higher positions. The Estes and Fausse soils are in lower positions. The Texla soils have a loamy surface and are on higher positions.

Component Description

Component geomorphic setting: Plain
Parent material: Clayey sediments of the Beaumont Formation
Typical vegetation: Loblolly pine, bushy bluestem, Alabama supplejack, sedges, longleaf uniola, panicums

Typical Profile

Surface layer:
0 to 3 inches; strongly acid, brown clay with red mottles
Subsoil:
3 to 11 inches; strongly acid, yellowish brown and light brownish gray clay with red mottles
11 to 30 inches; very strongly acid, gray and yellowish brown clay
30 to 47 inches; very strongly acid, gray clay with brown and red mottles
47 to 80 inches; strongly acid, grayish brown, brown, yellowish brown, and red clay

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 2 percent, the slope averages about 0.5 percent

Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 8.9 inches (Moderate)

Component Hydrologic Properties

Natural drainage class: Somewhat poorly drained
Runoff: High
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 0.5 to 1.5 feet from January through March

Interpretive Groups

Land capability nonirrigated: 3e
Land capability irrigated: Not assigned
Ecological site name: Not assigned
Woodland productivity class: 330 board feet per acre

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in forest. It is mainly used as woodland. Woodland areas consist mainly of a mixed pine and oak forest. Commercial trees used for timber production are loblolly pine, green ash, and sweetgum. Wetness is the most limiting feature of this soil for production and harvesting of timber. The seasonal high water table restricts the use of equipment for much of the year. Seedling survival of some species is affected in those years following extended wet periods. The seasonal high water table restricts root development. Trees occasionally are subject to windthrow during periods when the soil is wet. Using standard equipment with wheels or tracks on this soil causes rutting and compaction when the soil is wet. Puddling can occur during wet periods making unimproved roads and skid trails sticky, slick, and impassable. Woodland practices such as selective thinning and removal of undesirable trees should be carried out to maximize production.

Crops grown on this soil are responsive to good management. This soil is sticky when wet, hard when dry, and can become cloddy when plowed. Although producers have equipment to till these soils, the structure and tilth can be adversely affected when it is tilled when it is too wet or too dry. Plowpans commonly occur in cultivated fields that can be detrimental to dryland crop production because roots cannot readily penetrate the pan to obtain moisture and nutrients. Depending on the crops to be grown, a liming program should be considered to decrease the acidity of the soil. Drainage systems that include proper row direction and field drains with adequate outlets are needed to remove excess surface water after rains. A good fertility program is needed for consistent high production.

Rice is not typically grown as an irrigated crop. The soil generally has too much slope for rice production.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. Cool-season legumes produce winter forage while adding nitrogen to the soil.

Native range grasses, when properly managed, are capable of producing high yields on this soil. Soil wetness, caused by slow surface runoff and a seasonal high water table, is a concern.

Most urban uses are affected by soil properties. Soil wetness, caused by slow surface runoff and a seasonal high water table, is a concern. The clayey texture of the soil also requires special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets.

The Vamont soil is used by game and nongame wildlife. Pastures and forested areas provide habitat for a variety of mammals, birds, crustaceans, and reptiles.

VeA—Veston fine sandy loam, 0 to 1 percent slopes, frequently flooded, tidal

Map Unit Setting

General location: Gulf Coast Marsh of Southeast Texas
Major land resource area: 151
Geomorphic setting: Chenier
Elevation: 0 to 7 feet (0 to 2 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Veston soil and similar soils: 85 percent
Contrasting soils: Included with this soil in mapping are areas of Barnett, Creole, Franeau, and Harris soils. The Barnett soils have clayey subsoils. The Creole soils are fluid throughout. The Franeau soils are less saline and on higher positions. The Harris soils are clayey throughout.

Component Description

Component geomorphic setting: Tidal flat
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Switchgrass, gulf cordgrass, marshhay cordgrass, bushy sea-oxeye, seashore saltgrass

Typical Profile

Surface layer:
0 to 3 inches; moderately alkaline, moderately saline, very dark gray fine sandy loam with brown mottles
Subsurface layer:
3 to 5 inches; moderately alkaline, strongly saline, grayish brown fine sandy loam with gray, yellow, and brown mottles
5 to 8 inches; moderately alkaline, strongly saline, dark gray very fine sandy loam with gray and brown mottles
Subsoil:
8 to 16 inches; moderately alkaline, strongly saline, gray loamy very fine sand with gray and brown mottles
16 to 26 inches; moderately alkaline, strongly saline, gray very fine sandy loam with gray and brown mottles
26 to 38 inches; moderately alkaline, strongly saline, black clay loam with brown mottles
38 to 51 inches; moderately alkaline, strongly saline, gray loam with yellow mottles
51 to 60 inches; moderately alkaline, strongly saline, light gray and gray loam with yellow mottles

60 to 75 inches; moderately alkaline, strongly saline, white clay loam with yellow mottles
75 to 80 inches; moderately alkaline, strongly saline, white clay loam with gray and yellow mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Saline within 40 inches
Sodicity: Sodic within 40 inches
Available water capacity: About 3.9 inches (Low)

Component Hydrologic Properties

Natural drainage class: Poorly drained
Runoff: High
Annual flooding: Frequently flooded by runoff from the uplands, unusually high spring tides, and storm tides from June through October
Annual ponding: Not ponded
Seasonal high water table: A water table occurs at the surface to a depth of 2.0 feet throughout the year

Interpretive Groups

Land capability nonirrigated: 6w
Land capability irrigated: Not assigned
Ecological site name: Loamy Chenier

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in marsh. It is mainly used as rangeland and as habitat for wildlife. It is not suited to crop production, pasture, or woodland because of salinity and wetness. Flooding is also a hazard.

This soil is capable of producing high yields of marsh range grasses when properly managed. Plant vigor can be maintained by proper stocking and by using a grazing rotation system. This area is used extensively by livestock as bedding areas because it is relatively dry. The extensive use as bedding areas makes plant management difficult because it is easily overused. Prescribed burning also can be effectively used to help maintain plant vigor. Proper location of freshwater facilities and bedding areas for cattle help achieve proper grazing.

Most urban uses are affected by soil properties. Flooding and wetness does not allow septic systems to function properly without extensive modifications.

This Veston soil is used by game and nongame wildlife. The marsh provides habitat for a variety of mammals and birds.

VtA—Viterbo silty clay loam, 0 to 1 percent slopes

Map Unit Setting

General location: Gulf Coast Prairie of Southeast Texas
Major land resource area: 150A
Geomorphic setting: Plain
Elevation: 7 to 49 feet (2 to 15 meters)

Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 260 to 310 days

Map Unit Composition

Viterbo soils and similar soils: 85 percent
Contrasting soils: Included with this soil in mapping are areas of Labelle and League soils. Both of these soils have a darker colored surface layer, are better drained, and generally occur on slightly higher positions.

Component Description

Component geomorphic setting: Plain
Parent material: Loamy and clayey sediments of the Beaumont Formation
Typical vegetation: Big bluestem, little bluestem, yellow indiangrass, eastern gamagrass, switchgrass

Typical Profile

Surface layer:
0 to 7 inches; very strongly acid, grayish brown silty clay loam
Subsoil:
7 to 17 inches; very strongly acid, grayish brown silty clay loam with red and brown mottles
17 to 65 inches; strongly acid, gray silty clay and clay with brown mottles
65 to 80 inches; strongly acid, light gray clay with brown mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 9.2 inches (High)

Component Hydrologic Properties

Natural drainage class: Somewhat poorly drained
Runoff: High
Annual flooding: None
Annual ponding: Not ponded
Seasonal high water table: A perched water table occurs at a depth of 0.5 inch to 1.5 feet from December through April

Interpretive Groups

Land capability nonirrigated: 4w
Land capability irrigated: Not assigned
Ecological site name: Loamy Prairie

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in prairie. It is used as cropland, pasture, rangeland, and woodland. Rice and soybeans are the main crops grown. Some small grains are also grown.

Crops grown on this soil are responsive to good management. This soil is sticky when wet, hard when dry, and can become cloddy when plowed. Although producers have equipment to till these soils, the structure and tilth can be adversely affected when tilled when it is too wet or too dry. Plowpans commonly occur in cultivated fields and can be detrimental to dryland crop production because roots cannot readily penetrate the pan to obtain moisture and nutrients. Depending on the crop grown, a liming program should be considered to decrease soil acidity. Drainage systems that include proper row direction and field drains with adequate outlets are needed to remove excess surface water after rains. A good fertility program is needed for consistent high production.

Rice, grown as an irrigated crop, has no major concerns.

Pasture on this soil is responsive to good management. Adapted grasses include bahiagrass, dallisgrass, and common bermudagrass. A grazing management system, proper use of fertilizer, and a drainage system increases forage yields and improves quality. Cool-season legumes produce winter forage while adding nitrogen to the soil.

Native range grasses, when properly managed, are capable of producing high yields on this soil. Soil wetness, caused by low surface runoff and a seasonal high water table, is a concern.

In woodland areas, practices such as selective thinning and removal of undesirable trees should be carried out to maximize production. Wetness is the most limiting feature on this soil for production and harvesting of timber. The seasonal high water table restricts root development. Puddling can occur during wet periods making unimproved roads and skid trails sticky, slick, and impassable.

Most urban uses are affected by soil properties. Soil wetness, caused by low surface runoff and a seasonal high water table, is a concern. The clayey texture of the soil also requires special modifications and proper installation procedures so septic systems can function adequately. In addition, the high shrink-swell potential and low strength of the soil must be compensated for in the design and construction of buildings, roads, and streets. Coating steel pipe and treating concrete reduce corrosion concerns. The use of pipes made from less corrosive metals and materials are suitable alternatives to steel.

This Viterbo soil is used by game and nongame wildlife. Pastures, cropland, and forested and native grass areas provide habitat for a variety of mammals, birds, crustaceans, and reptiles.

W—Water

Component Description

This map unit is made up of perennial rivers, streams, and manmade or natural water bodies of 8 acres or more. Included with these areas of water are point bars, levees, or other earthen structures less than 5 acres.

ZuA—Zummo muck, 0 to 1 percent slopes, frequently flooded, tidal

Map Unit Setting

General location: Gulf Coast Marsh of Southeast Texas
Major land resource area: 151
Geomorphic setting: Freshwater marsh
Elevation: 0 to 3 feet (0 to 1 meters)
Mean annual precipitation: 50 to 60 inches (1,270 to 1,524 millimeters)
Mean annual air temperature: 70 to 72 degrees F (21 to 22 degrees C)
Frost-free period: 250 to 310 days

Map Unit Composition

Zummo soils and similar soils: 85 percent
Contrasting soils: Included with this soil in mapping are areas of Allemands and Beaumont soils, and water bodies. The Allemands soils have more than 16 inches of organic material. The Beaumont soils are drier.

Component Description

Component geomorphic setting: Marsh
Parent material: Firm clayey backswamp deposits
Typical vegetation: Maidencane, giant cutgrass, broadleaf cattail, California bulrush, switchgrass

Typical Profile

Surface layer:
0 to 8 inches; strongly acid, very dark gray muck
Subsurface layer:
8 to 16 inches; very strongly acid, black clay
16 to 24 inches; strongly acid, very dark gray clay with gray mottles
Subsoil:
24 to 34 inches; slightly acid, dark gray clay with yellow mottles
34 to 46 inches; slightly acid, gray clay with yellow mottles
46 to 80 inches; neutral, light gray to gray clay with yellow mottles

A complete soil description with range in characteristics is included, in alphabetical order, in the "Soil Series and Morphology" section.

Component Properties and Qualities

Slope: 0 to 1 percent, the slope averages about 0.1 percent
Slowest permeability class in the soil profile: Very slow
Salinity: Not saline within 40 inches
Sodicity: Not sodic within 40 inches
Available water capacity: About 10.9 inches (High)

Component Hydrologic Properties

Natural drainage class: Very poorly drained
Runoff: Negligible
Annual flooding: Frequently flooded by runoff from the uplands and storm tides throughout the year
Annual ponding: Frequently ponded from the surface to 1.5 feet above the surface throughout the year
Seasonal high water table: A water table occurs from the surface to more than 6 feet throughout the year

Interpretive Groups

Land capability nonirrigated: 7w
Land capability irrigated: Not assigned
Ecological site name: Firm Fresh Marsh

Additional information specific to the components of this map unit is available in the Tables section.

Use and Management

Historically this soil was in marsh. It is mainly used as habitat for wildlife. It is not suited to crop and pasture production because of wetness. Typically, trees do not grow on this soil.

This soil is susceptible to marsh erosion processes that allow the soil surface to be removed by water and alter the adapted plant community. The end result of this marsh erosion is typically barren areas. These areas are difficult to revegetate. Flooding is also a hazard.

This soil is capable of producing medium yields of marsh range grasses when properly managed. Prescribed burning can be effectively used to help maintain plant vigor but extreme caution should be used to prevent marsh erosion by maintaining the organic soil surface.

This soil is not suited to most urban uses. The organic nature of the soil, clayey texture, flooding, and permanently saturated soil conditions does not allow septic systems to function properly without extensive modifications. In addition, the low strength of the soil must also be compensated for in the design and construction of buildings, roads, and streets.

The Zummo soil is used by game and nongame wildlife. The marsh provides habitat for a variety of mammals, birds, and reptiles. This is also an important part of the marine estuary ecosystem by providing an abundant amount of detritus.

Prime Farmland

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forest land, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. The slope ranges mainly from 0 to 5 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources ConservationService.

About 250,000 acres in the survey area, or about 28 percent of the total acreage, meets the soil requirements for prime farmland and about 205,000 acres or about 23 percent of the total acreage, meets the requirements for prime farmland when drained

A trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are less productive.

The map units in the survey area that are considered prime farmland are listed in table 5. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding and wetness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

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 to prevent 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 behavioral characteristics of the soils. They collect data on erosion, wood production, wetness, salinity, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

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

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

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where 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

Ken McCain, Resource Team Leader, and Wayne Roberts, Agronomist, 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 Natural Resources 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 Natural Resources Conservation Service or the Texas Cooperative Extension.

Surface drainage is the major concern on the cropland and pastureland in Jefferson and Orange Counties. Because most of the soils have drainage concerns to some degree, and because the slopes are mostly nearly level, the soil remains wet for significant periods of time. Prolonged wetness affects plant growth. Drainage systems have been installed in many areas. In other places, inadequate natural outlets make any improvement difficult and expensive. Better drained soils such as Bienville, Sabine, and Anahuac do not need drainage systems.

Preparing a seedbed is difficult on clayey soils, such as Beaumont, Bevil, China, League and Vamont. However, farmers are generally familiar with this difficulty and deal with it effectively.

Soil tilth is an important factor in seed germination and water infiltration. The surface layer of the soil should be granular or porous. Clayey soils such as Beaumont, Bevil, China, League, and Vamont are typically dense and require tillage to break up the soil enough to make a good seedbed. Regular additions of crop residue improve the soil structure which, in turn, improves soil tilth.

Management of Cultivated Crops

In Jefferson and Orange Counties, the main soil related management concerns for cropland are drainage, maintaining soil tilth, and fertility. The erosion hazard is only significant on a few soils in the county.

In many areas suitable for cropland, excess water moves from the surface very slowly because most of the soils are nearly level and are slowly permeable or very slowly permeable. Following rains, these soils remain wet for prolonged periods. Wetness makes it difficult to carry out necessary land treatment with farming operations such as seedbed preparation, planting, and harvesting in a timely manner. Prolonged wetness also delays germination, affects plant growth, and reduces production.

Properly installed drainage systems helps remove excess surface water from cropland. Many areas are not drained because adequate outlets are not available. Before a drainage system is installed, the availability of adequate outlets should be determined. The system should be planned so it does not hinder the operation of farm equipment. Row arrangement and direction should also be considered.

Soil tilth is important because it determines soil aeration. Soil fertility is economically important because it determines the amount of commercial fertilizers needed for crop production goals. Tilth and fertility are maintained by maintaining or increasing the organic matter content of the soil through the addition of crop residue by crop residue management. Increasing organic matter increases available water capacity and soil aeration. It improves the water infiltration rate and decreases runoff and soil erosion. Soil conditions necessary for seed germination are improved.

With crop residue management, crop residues are left on the surface which will protect the soil from raindrops that destroy the natural soil aggregates and cause crusting. A thick crust effectively seals the soil surface and thus reduces water intake, increases runoff, retards seed germination, and accelerates soil erosion. Crop residue contributes to better water infiltration, tilth, aeration, and maintaining organic matter which increases natural fertility.

Managing crop residues addresses other management concerns such as control of erosion and the conservation of moisture. Erosion is detrimental because it takes away the moist fertile upper part of the soil and deposits sediment into bayous, creeks, and rivers. Soil erosion by water is generally underestimated in cropland because it is not easily noticed. However, the normal cropping sequence and tillage practices on the soils that are nearly level generally control erosion within acceptable limits. On the more sloping soils in the counties, erosion can be controlled by intensive management such as installing terraces. Since installing and maintaining these practices are expensive and acreage is small, most landowners do not crop these areas but instead use for pasture or woodland.

Although at times the soil is too wet, conserving soil moisture is important with crops that may go into drought stress during the summer when rainfall is below normal. Conserving soil moisture through timely planting, proper tillage, and crop residue management enables the plants to produce a crop in most years.

Crop residue management is achieved with minimum tillage or conservation tillage practices. Conservation tillage reduces the number of trips over the field with farm equipment. This tillage method leaves more crop residue on the surface than conventional tillage and reduces tillage cost and increases soil tilth.

All cultivated soils in the county respond to additions of commercial fertilizers. The kind and amount of fertilizer needed varies by soil type, crop to be grown, desired production, previous land uses, and season of the year. Additional nitrogen fertilizer is needed when crop residue is abundant. A large amount of nitrogen is tied up by the micro-organisms that decompose organic matter and convert it to humus. The additional fertilizer assures enough nitrogen is available for both the micro-organisms and the growing crop. The nitrogen used by these organisms is not lost but is released later in the season.

Some soils in Jefferson and Orange Counties, on the coastal prairie, generally have a favorable soil reaction, or pH range, for commonly grown crops. However some soils do need lime application to raise the pH to a desirable level to allow nutrients to become more available to the plant.

For all soils, fertilizer and lime additions should be based on soil test results, on crop needs, and on expected yield levels. The local Natural Resources Conservation Service office and Texas Cooperative Extension can help determine the kinds and amounts of fertilizer to apply.

Another management practice is the use of a cropping system, or crop rotation, that improves soil tilth; protects the soil during heavy rains; helps to control weeds, insects, and plant diseases; and provides an economic return. The most common rotation system in Jefferson and Orange Counties is rice followed by idle years of grazed unimproved pasture. These pastures consist of voluntary annual and perennial grasses and forbs. This system is a good pest management practice to help control volunteer and residual red rice by grazing from cattle. Rice-soybean rotations were common in the past but because of drainage, wetness concerns, and poor yields its use has declined.

Many soils in the county are well suited to rice because the topography is flat and the subsoil is very slowly permeable (fig. 15). The main rice-producing soils in order of suitability are Labelle, League, Vamont, China, Viterbo, Beaumont, Bevil, Morey, Levac, Anahuac, Aris, Spindletop, Meaton, Franeau, Leton, Orcadia, Texla, and Evadale.

League, Labelle, Vamont, and China soils have the highest yield potential for rice production with even flat slopes, natural fertility, and a favorable soil reaction (fig. 16). Rice-pasture rotations are commonly 1 year rice followed by 2 years idle pastureland.

Viterbo, Beaumont, China, and Bevil soils have the second highest yield potential. These soils have lower natural fertility and soil reaction. Rice-pasture rotations are commonly 1 year rice followed by 3 years idle pastureland.

Morey, Franeau, Aris, Leton, Anahuac, Spindletop, Meaton, Levac, Orcadia, Texla, and Evadale soils are the lowest rice producing soils with production concerns caused by loamy textures and extreme wetness. Rice-pasture rotations are commonly 1 year rice followed by 4 to 5 years idle pastureland.

Franeau and Meaton soils are saline or saline-influenced soils located near the marsh and have management concerns, caused by wetness and salts, when used for cropland. Access to these soils is dependent upon nature because of tidal marsh influences which create wetness and poor drainage. Salts are a problem on these soils; they should not be allowed to dry out and should be flushed several times. Crop residues and vegetative cover following harvest helps to control salt.

Aris and Leton soils occur on large wet flats that are in the lowest part of the field. Management concerns include plowing and harvesting when the soils are wet. Orcadia, Anahuac, Morey, and Spindletop are mounded soils. Management concerns include poor fertility, a sandier surface texture, and seepage of levees. The sandy surface layer requires larger amounts of water to fill the soil profile with water. Constructing levees a year before planting and allowing the soil to consolidate and firm up helps prevent levee seepage. By maintaining a shallow flood, the pressure on the top levees is reduced.

Figure 15.—Rice production on an area of China clay, 0 to 1 percent slopes. The orange tarpaulin is used on levees where water flows from one terrace to another, and prevents the occurrence of water erosion.

Figure 16.—Plowed field of Labelle-Levac complex, 0 to 1 percent slopes. The dark colored areas are the Labelle soils, and the lighter colored areas are Levac soils.

Levac is a soil mapped as part of a soil complex. The original surface of the soils in this map unit had small pimple mounds on them. These mounds were removed and the Levac soil was what remained. Overall yields are lower on these units without careful management because of salinity. As the soil surface dries out, water evaporates from the soil surface but the salts that were in the evaporating water remain on the soil surface. As more water evaporates, more salts accumulate on the surface and the soil surface can become saline over time. Fields should not be allowed to dry out during production. One practice is to disk in the fall, flood over the winter, and water seed rice in the spring with a continuous flood. Fields are commonly idle for 5 years. Maintaining vegetative cover through crop residues following rotations help control salt. These practices reduce water evaporation from the soil surface which reduces the buildup of salts.

Texla soils are loamy flatwood soils with no uniform grade or slope. When constructing a uniform grade for rice production, “water leveling,” discussed in “Rice in a Crop Rotation,” is used on this soil but it is a problem because of the depth of the loamy surface texture. When flooded with water the soil becomes boggy and tractors have difficulty working the fields. Land leveling is a more suitable alternative on these soils to achieve a uniform grade. This should be done a year ahead of time to allow soil particles to consolidate. These soils are also low in fertility and applying lime will help increase nutrient availability and increase production.

Evadale is another flatwood soil that occupies a lower position on the landscape than Orcadia and Texla soils and is found on large wet flats. It has problems with poor drainage and is the last part of the field to dry out, which creates problems for seedbed preparation and harvesting.

Rice Production

Dr. Garry McCauley and Dr. Fred Turner, Texas A&M University helped prepare this section

Rice production began in Jefferson County in the late 1890’s, more than a century ago. Although the rice acreage has fluctuated, Jefferson County’s rice acreage peaked at about 70,000 acres as economics and mechanization improved. Orange County’s rice acreage is usually about 10 percent of Jefferson’s County’s. Orange County has less of the nearly level topography (1- to 3-foot drop per mile) with poor internal drainage that makes the soil particularly well suited to flooded rice production (fig. 17).

The soils in the counties are level, poorly drained, and somewhat poorly drained. These soils coupled with high annual rainfall, severely restrict row crop production. Thus rice is the primary crop. Another advantage the Texas coast has for rice production is the relatively long growing season (275 frost-free days). This allows for the production of one main rice crop followed by a rice ratoon crop which is the regeneration of panicle-bearing tillers after main crop harvest. The growing season in Arkansas, Mississippi, and California is too short for a ratoon crop. Ratooning is commonly practiced in this area since the 1960’s when rice varieties were developed that matured in less than 130 days. Substantial increases in rice yields (25 percent) began in 1983 when semidwarf varieties were developed. Main rice crop yields have increased to about 5,000 to 6,000 pounds grain per acre and ratoon crops averaged 1,500 pounds per acre by the mid 1990s. Rice has become an integral part of the Texas coastal ecology system. Besides providing a healthy food for humans, it provides food and habitat for aquatic organisms and local and migratory water fowl. Research shows that rice fields act as wetlands to purify water resources. As a result rice production is a major contributor to the area ecology and economy.

Figure 17.—Rice ready for harvest on League clay, 0 to 1 percent slopes.

General Rice Culture

Currently, Texas rice production is so highly mechanized that two to three people can produce 1,000 acres of rice by using a commercial aerial applicator service to apply seed, pesticide, and fertilizer and then hiring several people to transport the rice during harvest. Seedbed preparation begins in late summer to early fall of the previous year using conventional tillage equipment. Levees are constructed at about 0.15- to 0.2-foot contour intervals in the fall of the previous year to allow the clay to consolidate into a firm levee. Seeds are not planted until April. Usually seed are aerially applied (water planted) into 4 to 6 inches of floodwater or aerially applied onto dry soil, covered and flush irrigated. The water is removed from the water planted rice after 5 to 10 days. One to two applications of herbicide are applied between rice emergence and establishing the flood 25 to 35 days later after the rice reaches the 5-leaf (2 tiller) stage of growth. At this time a shallow flood of a few inches is established and maintained on the field. The field remains flooded until about 2 weeks before harvest. The flood is removed to allow the soil to dry and firm for harvest. When harvesting the main crop before the third week of August, a ratoon crop is possible and production can begin by applying nitrogen on the dry soil and then reestablishing the flood soon after the main crop harvest. Ratoon crops are harvested during October and November.

Fertilizer Management

Fertilizer is usually applied in three applications. About 30 percent of the nitrogen and all of the phosphorus and potassium is applied preplant or by the 3-leaf stage of growth. About 40 percent of the nitrogen is applied on dry soil just prior to flooding and the remaining 30 percent at the panicle differentiation (PD) stage of growth. The total nitrogen rate varies with rice variety, the semidwarf varieties require the most (about 170 pounds of nitrogen per acre). The anaerobic flooded soil and the thin oxidized layer (0 to 0.5 inch) at the soil-water interface have a profound influence on nitrification and subsequent denitrification loss of the ammonium nitrogen sources (urea and some ammonium sulfate) applied to Texas rice fields. Applying the nitrogen at three different stages of growth helps overcome the nitrogen loss because of denitrification. Using these nitrogen management principles, soil testing to determine the need for phosphorus, and the chlorophyll meter to measure the need for additional nitrogen fertilizer, environmentally and economically sound fertilizer management practices has been developed.

Rice in a Crop Rotation

Because of acreage controls on rice and the need to control red rice, aquatic weeds, and diseases, rice is usually rotated with pasture; 2 to 3 years of pasture (or row crop if possible) followed by rice is common. Rice rotation with crawfish has also proved beneficial for red rice control when crawfish markets are economical.

The use of some type of landforming and the construction of irrigation levees are common practices when growing rice. Landforming can be done with a land plane or by water leveling. The objective is to make the land as smooth and level as possible within irrigation borders (levees) so that a uniform water depth is achieved. Water land leveling consists of flooding the field and moving the soil hydraulically from the high areas to the low areas within the border by using blades attached to farm tractors. When properly designed and installed, landforming effectively utilizes rainfall and improves surface drainage.

Management of Pasture and Hayland

Many soils in the counties are capable of growing improved grasses and legumes such as improved bermudagrass, common bermudagrass, bahiagrass, dallisgrass, and white clover. These soils have good drainage to provide an environment for a manageable stand (70 to 80 percent cover) of improved grasses. These soils have the capability to be managed as tame pastures with intensive pasture management practices. Tame pasture management is economically feasible on these soils. These soils include Morey, Spindletop, Anahuac, Spurger, Craigen, and Bienville. Production on these soils can be improved with good pasture management.

Good pasture management practices include liming, fertilizing, maintaining proper grazing heights of plants, managing weeds and brush, rotational grazing, maintaining livestock water supplies, and surface drainage. Soil types, plant species, and the desired production level determine fertilization rates (fig. 18).

Other soils however, have inherent wetness and specific plant adaptations. These areas have plants consisting of 30 to 40 percent of non-desirable species of low forage quality such as sedges and rushes. Improved grasses are not adapted to these wet sites unless they are adequately drained. This makes managing a pasture as a manageable unit for an improved species difficult.

Because of the undesirable species in these pastures, they are managed as native pastures and various levels of tame pasture management such as liming and fertilization are not commonly practiced on most soils because of economics. Weed control is practiced and achieved by mowing and applying chemicals. Proper grazing, rotational grazing, and weed control on these soils help keep the desired species (common bermudagrass, bahiagrass, dallisgrass, and carpetgrass) in the areas where they are adapted in the pasture. Pasture production on soils under this level of management ranges from 1.2 AUM to 4 AUM (animal unit month).

Soils on the coastal prairie include the Aris, Beaumont, Bevil, China, Labelle, Levac, League, Leton, Meaton, Morey, and Orcadia. Soils on the forested flatwood areas of the counties produce low forage value because of inherent wetness and species adaptations. These poorly drained flatwood soils include Texla, Camptown, Mollco, and Evadale. The fields in the flatwoods must be adequately drained for the desired pasture production.

Figure 18.—Livestock grazing on mostly dallisgrass and common bermudagrass on an area of Texla-Evadale complex, 0 to 1 percent slopes.

Draining fields and low areas on these soils improve desired species production. Surface drainage is needed to remove excess surface water following rains. Drainage improves soil aeration, which in turn promotes better plant growth and allows improved grasses to become established in these areas. The high cost of drainage limits this as an alternative and in some areas the lack of adequate outlets prevents the installation of good drainage systems.

Many pastures are overseeded with white clover to improve forage quality. Overseeding with ryegrass is a common practice for winter grazing.

Chinese tallow, smutgrass, and a variety of broadleaf weeds such as sumpweed and common ragweed are common in the area. They can be controlled with good grazing management, chemical applications, and mowing.

In Jefferson and Orange Counties, hay is made from common bermudagrass and varieties of bahiagrass such as Pensacola and Argentine (fig. 19). Good hay management includes fertilizing and cutting the forage at the proper height and proper stage of growth. Liming hay meadows improves nutrient availability and increases hay quality with fertilization. The same soils adapted for intensive pasture management are well suited to hayland.

Yields per Acre

The average yields per acre that can be expected of the principal crops and irrigated crops under a high level of management are shown in table 6. 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.

Figure 19.—Round bales of common bermudagrass and bahiagrass on an area of Anahuac very fine sandy loam, 0 to 2 percent slopes.

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 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.

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

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

Crops other than those shown in table 6 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 Natural Resources Conservation Service or the Texas Cooperative Extension 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 rangeland, for woodland, and for engineering purposes (fig. 20).

Figure 20.—An area of Morey-Levac complex, 0 to 1 percent slopes. The Morey and Levac soils are in Land Capability Class 3w.

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 numerals 1 through 8. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have few limitations that restrict their use.

Class 2 soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class 5 soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation.

Class 7 soils have very severe limitations that make them unsuitable for cultivation.

Class 8 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 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w*, *s*, or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, 2e-4 and 3e-6.

Rangeland

Edward Seidensticker, resource conservationist, Natural Resources Conservation Service prepared this section

Rangeland is defined as land on which the native vegetation (the climax plant community) is predominantly grasses, grasslike plants, forbs, shrubs, and trees. Rangeland includes natural grasslands, savannahs, coastal marshes, and wet meadows. Rangeland receives no regular or frequent cultural treatment. The composition and production of the natural plant community is determined mainly by soil, climate, and topography.

Wildfire and grazing by large ruminant animals were a natural part of the rangeland ecosystem. The tall grass prairie evolved through repeated cycles of burning and grazing, which perpetuated tall grasses, forbs, and legumes.

Grazed forestland is defined as land on which the understory includes, as an integral part of the forest plant community, plants that can be grazed without significant impairment of other forest values.

Native pasture is defined as land on which the potential (climax) vegetation is forest but which is used and managed primarily for the production of native forage plants. Native pasture includes cut-over forestland and forestland that has been cleared and is managed for native or naturalized forage plants.

The rangeland is used primarily for grazing by livestock; however, its use as wildlife habitat is becoming increasingly important as more landowners choose to lease hunting rights and develop recreational activities for additional sources of income.

The rangeland in Jefferson and Orange Counties originally produced a wide variety of grasses interspersed with an abundance of forbs; and evolved under the collective influence of ungulate grazing, fire, variable climatic events, insects, rodents, and other wildlife. Effective range management practices that mimic the historical influences can help to maintain or re-establish these high quality plants.

Rangelands are assigned to “ecological sites” which are sometimes called “range sites.” An ecological site is a distinctive kind of land with specific physical characteristics that makes it different from other kinds of land in its ability to produce a distinctive kind and amount of vegetation. Many different rangeland ecological sites occur in the soil survey area. Over historical time, the combination of plants best suited to a particular soil and climate became dominant. If the soil is not excessively disturbed, this group of plants is the historic climax plant community for the site. Historic climax plant communities are not static but vary slightly from year to year and place to place.

The relationship between soils and vegetation was ascertained during this survey; thus, rangeland ecological sites generally can be determined directly from the soil map. Soil properties that affect moisture supply and plant nutrients have the greatest influence on the productivity of plants. Soil reaction, salt content, and a seasonal high water table are also important. The "Field Office Technical Guide," which is available at local offices of the Natural Resources Conservation Service or online at http://www.nrcs.usda.gov/technical/efotg, can provide specific information about ecological sites.

Table 7 shows for each soil that supports rangeland vegetation suitable for grazing, the ecological site name and the total dry-weight production of vegetation in favorable, normal, and unfavorable years. An explanation of the column headings for this table follow.

Dry weight is the total annual yield per acre of air-dry vegetation. Yields are adjusted to a percent of air-dry moisture content. The relationship of green weight to air-dry weight varies according to such factors as stage of maturity, exposure, amount of shade, recent rains, and unseasonable dry periods.

Total dry-weight production is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture. Yields are adjusted to a percent of air-dry moisture content. The relationship of green weight to air-dry weight varies according to such factors as stage of maturity, exposure, amount of shade, recent rains, and unseasonable dry periods.

A typical growth curve for native perennial vegetation representing the percentage of total growth occurring each month for Gulf Coast Prairie would be:

Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1	2	5	12	20	23	8	5	10	10	3	1

Approximately 63 percent of the annual production of forage occurs in the months April through July responding to spring and early summer rains for the Gulf Coast Prairie. A second smaller growth period may occur in the fall if sufficient moisture is available.

A typical growth curve for native perennial vegetation representing the percentage of total growth occurring each month for Gulf Coast Marsh (wet) would be:

Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
0	0	10	15	15	20	10	5	10	10	5	0

Approximately 60 percent of the annual production of forage occurs in the months April through July responding to spring and early summer rains for the Gulf Coast Marsh (wet). A second smaller growth period may occur in the fall if sufficient moisture is available.

Nearly all plant communities have undergone changes over time. Many years of continuous livestock grazing, the absence of fire, the invasion of plants that were not originally in the plant community, and climatic events such as major droughts, have all interacted to affect changes in the vegetation on rangeland.

Abnormal disturbances that change the historic climax plant community include repeated overuse by livestock, excessive burning, erosion, and plowing. Grazing animals select the most palatable plants. These plants will eventually die if they are continually grazed at a severity that does not allow for recovery. Under these conditions, less desirable plants, such as annuals and weed-like plants can increase. Usually, these degradation processes (also called retrogression) take place over many years. If the plant community and soils have not degraded significantly, high quality native plants may return, with proper grazing management.

The Natural Resources Conservation Service and other agencies assist landowners in identifying problems and concerns, as well as opportunities to maintain or improve their rangeland resources. A rangeland ecological site may be evaluated by three distinct methods: similarity index, rangeland trend, and rangeland health.

A similarity index is the percentage, by weight, of a comparison of the present plant community to the historic climax plant community. This index provides an indication of past disturbance as well as potential for improvement.

Rangeland trend determinations assess the direction of change occurring in the present plant community compared to the historic climax plant community. The plant community may be either moving toward or away from the historic climax plant community. This rating provides information to landowner regarding the direction of change in plant community in response to present management.

Rangeland health is a determination of how the ecological processes on a rangeland ecological site are functioning. Ecological processes evaluated include water cycle, nutrient cycle, and energy flow.

Knowledge of the ecological site is necessary as a basis for planning and applying the management needed to maintain or improve the desired plant community for selected uses. Such information is needed to support management objectives, develop planned grazing systems and stocking rates, determine suitable wildlife management practices, evaluate the potential for recreational uses, and determine the condition of watersheds.

How rangeland is managed affects forage production, species composition, plant health, and the ability of the vegetation to protect the soil. Rangeland management requires knowledge of the kinds of soil and of the historic climax plant community. Effective range management conserves rainfall, enhances water quality, reduces the hazard of downstream flooding, improves yields, provides forage for livestock and wildlife, enhances recreational opportunities, and protects the soil.

The primary range management practices used in Jefferson and Orange Counties include prescribed grazing, stock-water developments, and fences. If undesirable plants become dominant, range seeding, brush management, or prescribed burning are commonly used.

Controlled Fire

Fire is widely used as a management tool in marsh areas. Marsh fires occurred long before settlement of the area by the Europeans. Ranchers and wildlife managers burn off the dense vegetative cover, which stimulates new succulent marsh vegetation or changes the plant community by setting back plant succession. Vegetation is severely damaged by burns during periods of drought in the spring and summer.

It is recommended that no more than 50 percent of any management area is burned in any 1 year. Areas to be burned are alternated, areas should be staggered at 2-week intervals beginning in August or September and ending by mid-November. Green regrowth will be in various stages of growth at all times. Comply with applicable State and Federal laws before setting any fire.

If used properly, fire is a useful tool in the management of duck marshes. Burning removes heavy rough vegetation and creates desirable open water areas for ducks. Burning of duck marshes is best in early spring after water levels expose rough vegetation.

Sawgrass and cutgrass produce crops of palatable seed, but the stands of these plants are often dense. Little seed is available to ducks. Since both of these plants produce seed early, there is a possibility of making more seed available by burning in the fall of the year after the seed has shattered.

No burning should be done during the nesting season of the mottled duck in May or June, or at any time when the soil is dry. Damage will occur to sod or to roots in dry conditions.

Ecological Sites

Thirteen Ecological Sites have been identified in Jefferson and Orange Counties.

Blackland Ecological Site

The plant community is a true prairie on clayey upland soils. This site is dominated by little bluestem, indiangrass, eastern gamagrass, switchgrass, and Florida paspalum. It has lesser amounts of other paspalums, bluestems, sedges, and rushes. The soils include both somewhat poorly drained and poorly drained. The poorly drained soils tend to have somewhat lower production and quality and tend to respond slower to plant community improvement.

Firm Brackish Marsh Ecological Site

Marshhay cordgrass and/or seashore saltgrass dominate this site. Saltmarsh bulrush and needlegrass rush are also found in smaller amounts. Elevation, drainage, and salinity play a major role in the kinds and amounts of secondary vegetation that occur on this site. Small areas of open water are also included. These areas are important to waterfowl and other wildlife because of habitat diversity. Surface water salinity levels vary during the year depending on rainfall and tides. This causes temporary shifts from intermediate marsh to brackish marsh vegetative types. Fresher water and slightly higher elevated parts of the site are indicated by the presence of common reed.

Firm Fresh Marsh Ecological Site

When water depths range from minus 2 inches to plus 6 inches and the water contains less than 0.5 parts per trillion (ppt) salt, Jamaica sawgrass is dominant. As average water depth increases to 0 to 12 inches, giant cutgrass and American lotus dominates. Giant cutgrass also prefers a salt content of less than 0.5 ppt. In the deepest fresh marsh, where water levels average 1 to 12 inches and salt content is from 5 to 10 ppt, maidencane is dominant. Cattails grow with the California bulrush, especially in water 2 to 18 inches deep and contain up to 15 ppt salt. These plant communities intergrade where water tolerance levels overlap. Other plants such as switchgrass and common reed are locally prominent where their optimum water levels and salinity content are found.

Firm Intermediate Marsh Ecological Site

The central concept of this site is somewhat isolated from salt water intrusion. The salinity ranges are never high but there is some salinity in the soil that will manifest itself during periods of dry weather. The best indicator plant on this site is seashore paspalum. Lesser amounts of California bulrush, olney bulrush, softstem bulrush, marshhay cordgrass, spikesedges, seedbox, Colorado River hemp, and cattails are also found. Elevation, drainage, salinity, water depth, and duration play a major role in the vegetation. Small areas of open water are also included. These areas are important to waterfowl and other wildlife because habitat diversity. Water salinity level varies throughout the year. Fresher water is indicated by the presence of narrowleaf cattail, seedbox, whorled penneywort, and softstem bulrush (fig. 21).

Fluid Brackish Marsh Ecological Site

This is a brackish marsh site dominated by marshhay cordgrass with lesser amounts of seashore saltgrass, and various sedges and rushes. Water level and salinity play a major roll in the secondary vegetation. The water salinity generally ranges from 5 to 15 ppt but will be much higher during storm tides or completely fresh during flooding. Also included in this site may be small areas of open water. The open water areas contain plants such as dwarf spikerush and Widgeongrass.

Figure 21.—An area of Harris clay, 0 to 1 percent slopes, frequently flooded, tidal, which is in the Firm Intermediate Marsh Ecological Site.

Fluid Fresh Marsh Ecological Site

When water depths range from minus 2 inches to plus 6 inches and the water contains less than 0.5 ppt salt, Jamaica sawgrass is dominant. As average water depth increases to 0 to 12 inches, giant cutgrass and American lotus dominates. Giant cutgrass also prefers a salt content of less than 0.5 ppt. In the deepest fresh marsh, where water levels average 1 to 12 inches and salt content is from 5 to 10 ppt, maidencane is dominant. Cattails grow with the California bulrush, especially in water 2 to 18 inches deep and containing up to 15 ppt salt. These plant communities intergrade where water tolerance levels overlap. Other plants such as switchgrass and common reed are locally prominent where their optimum water levels and salinity content are found (fig. 22).

Figure 22.—Marsh dominated by maidencane and arrowhead on an area of Larose mucky peat, 0 to 1 percent slopes, which is in the Fluid Fresh Marsh Ecological Site.

Fluid Intermediate Marsh Ecological Site

The central concept of this site is somewhat isolated from salt water intrusion. The salinity ranges are never high but there is some salinity in the soil that will manifest itself during periods of dry weather. The best indicator plant on this site is seashore paspalum. Lesser amounts of California bulrush, olney bulrush, softstem bulrush, marshhay cordgrass, spikesedges, seedbox, Colorado river hemp, and cattails are also found. Elevation, drainage, salinity, water depth, and duration play a major role in the vegetation. Small areas of open water are also included. These areas are important to waterfowl and other wildlife because of habitat diversity. Water salinity level varies some throughout the year. Fresher water is indicated by the presence of narrowleaf cattail and softstem bulrush.

Fluid Saline Marsh Ecological Site

This plant community is dominated by smooth cordgrass which is specifically adapted to this site. Average depth of water at high tide ranges from 2 to 12 inches and water salinity varies from 12 to 50 ppt, but may become fresher during periods of high rainfall. Increaser plants are seashore saltgrass, glassworts, maritime saltwort, and saltmarsh bulrush. Widgeongrass may occupy some of the open water adjacent to the tidal flat (fig. 23).

Figure 23.—Rangeland dominated by smooth cordgrass on an area of Scatlake mucky clay, 0 to 1 percent slopes, very frequently flooded, tidal, which is in the Fluid Saline Marsh Ecological Site.

Loamy Chenier Ecological Site

Gulf cordgrass dominates this site. Little bluestem, switchgrass, indiangrass, marshhay cordgrass, knotroot bristlegrass, and longspike tridens are also found in smaller amounts. The soils are loamy throughout in low-lying areas of the inland side of the geologic beach ridges along the Gulf of Mexico. As retrogression occurs on this site, the percent of Gulf cordgrass increases. In more saline areas, Gulf cordgrass is more dominant. Where the salinity is slightly lower and the elevation is lower, common reed is more abundant.

Loamy Prairie Ecological Site

This is a true prairie on loamy surfaced upland soils. The climax plant community is dominated by little bluestem with lesser amounts of indiangrass and switchgrass. Also included are eastern gamagrass, paspalums, and panicums. The soils include both somewhat poorly drained and poorly drained. The poorly drained soils tend to have somewhat lower production and quality and tend to respond slower to plant community improvement (fig. 24).

Lowland Ecological Site

The climax plant community is a wet upland prairie. It is dominated by plants that tolerate extended periods of wetness. The dominant plants are switchgrass, maidencane, and eastern gamagrass. It includes lesser amounts of indiangrass, bluestems, paspalums, panicums, sedges, and rushes. This site remains saturated to the soil surface for extended periods of time. Depth and duration of any ponding and drainage improvement will impact the plant community. This site is usually small and/or narrow and is important to wildlife because of habitat diversity.

Figure 24.—Rangeland with encroaching Chinese tallow trees on an area of Morey-Spindletop complex, 0 to 1 percent slopes, which is in the Loamy Prairie Ecological Site.

Sandy Chenier Ecological Site

The climax plant community of the site is "patchy," depending on topography and elevation. The sandy ridges and mounds are dominated by little bluestem. Subdominant species are switchgrass and gulfdune paspalum. Switchgrass is the dominant plant in the swales. Eastern gamagrass, longtom, and marshhay cordgrass also grow in the depressions.

Salty Prairie Ecological Site

Gulf cordgrass dominates this site. Little bluestem, switchgrass, indiangrass, marshhay cordgrass, knotroot bristlegrass, and longspike tridens are also found in smaller amounts. The soils are clayey throughout. This site is one of the transition sites between upland range sites and marsh range sites. As retrogression occurs, the percent of Gulf cordgrass increases. In more saline areas, Gulf cordgrass is more dominant. Where the salinity is slightly lower and the elevation is lower, common reed is more abundant.

Forestland

Ray Stoner, forester and James Stevens, forester assisted in preparing this section

There are over 830,000 acres in the two counties in this survey, approximately 24 percent or 201,000 acres are commercial or potentially commercial timberlands. While only about 12 percent of Jefferson County is forested, over 55 percent of Orange County is covered in forest. These forestlands are found primarily on the northern half of Orange County and along the Neches and Sabine Rivers in the northern part of Jefferson and Orange Counties. Other forested lands include large, isolated areas, such as the Lawhorn Woods near Fannett, and smaller areas along bayous. In addition, trees have encroached on the clayey prairie soils in many places.

The Oak-gum-cypress type of forest covers 44 percent of the forestlands, and half of the forests in Jefferson County are of this type. The oak-hickory and oak-pine type of forest makes up another 45 percent, while pine accounts for the remaining 11 percent. Industrial forests are more prevalent in Orange County, comprising more than 44,000 acres, compared to about 5,600 acres in Jefferson County.

Major timber users within and nearby Jefferson and Orange Counties include two pulp and paper mills and two large sawmills. In addition, several smaller users such as small saw- and tie-mills operate within the counties.

Encroachment of undesirable species such as Chinese tallow and maple are a concern during all phases of forest management. Improper harvesting methods also limit the potential production. Other site and soil related concerns include species suitability, access, and stand establishment. These will be discussed for each mapping unit below.

The Allemands, Bancker, Barbary, Barnett, Caplen, China, Creole, Franeau, Harris, Ijam, Levac, Leton, Meaton, Neches, Neel, Sabine, Baines, Scatlake, Veston, and Zummo soils do not have woodland productivity information. This may be because of adverse soil conditions that inhibit tree growth, such as, high salinity, a seasonal high water table, or flooding. In some cases, soils in the survey area are part of a prairie environment that have not had trees as part of its ecosystem. In other cases, there is not enough acreage planted to commercially grown trees in order to make a valid assessment on capability.

Forest Soils

Twenty-one soils suitable for the management of forestland have been identified in Jefferson and Orange Counties.

Anahuac

This soil is on uplands and although it formed under prairie conditions, trees have encroached. For this reason, it may be considered suitable for the management of pine and hardwoods. Common trees of the overstory, when forested, include loblolly pine, water and willow oaks, and green ash. The site index for loblolly pine is 90 feet on a 50-year curve (60 feet on a 25-year curve) but can range from 85 to 95. The yield from an unmanaged stand of loblolly pine, over a 50-year period, is approximately 330 board feet (Doyle Rule) per acre per year. Management can substantially increase this yield.

The high shrink-swell nature of this soil may cause sweep in trees; thus, this soil is better suited to short rotation management schemes. A high water table during the winter and spring months may restrict access. During wet periods, care must be taken to avoid excessive rutting and the use of roads should be limited. Traffic restrictions or vehicles with modified equipment, such as, wide or floatation tires and four-wheeled drive are recommended. Crowning and raising the roadbed is recommended, but must be designed so that natural drainage is not interrupted. The low strength characteristics of this soil limit its use for road material. The high available water holding capacity of this soil leads to a competition problem for new seedlings. Site preparation or release measures that control invading brush may be needed.

Aris

This soil is on uplands and although it formed under prairie conditions, trees have encroached. For this reason, it may be considered suitable for the management of pine and hardwoods. Common trees of the overstory, when forested, include loblolly pine, water and willow oaks, sweetgum, and green ash. The site index for loblolly pine is 90 feet on a 50-year curve (60 feet on a 25-year curve) for bottomland oaks the site index is between 75 and 80 feet. The yield from an unmanaged stand of loblolly pine, over a 50-year period, is approximately 330 board feet (Doyle Rule) per acre per year. Management can substantially increase this yield.

The high shrink-swell nature of this soil may cause sweep in trees; thus, this soil is better suited to short rotation management schemes. A high water table during the winter and spring months may restrict access. During wet periods, care must be taken to avoid excessive rutting and the use of roads should be limited. Traffic restrictions or vehicles with modified equipment, such as, wide or floatation tires and four-wheeled drive are recommended. Crowning and raising the roadbed is recommended, but must be designed so that natural drainage is not interrupted. The low strength characteristics of this soil limit its use for road material. The high available water holding capacity of this soil leads to a competition problem for new seedlings. Site preparation or release measures that control invading brush may be needed. The poor drainage may cause significant seedling mortality. Bedding and scheduling planting during the early part of the planting season should be considered.

Beaumont

This soil is on uplands and although it formed under prairie conditions, trees have encroached. For this reason, it may be considered suitable for the management of pine and hardwoods. Common trees of the overstory, when forested, include loblolly pine, water and willow oaks, sweetgum, and green ash. The average site index for loblolly pine is 90 feet on a 50-year curve (60 feet on a 25-year curve), but can range from 85 to 95 feet. For bottomland oaks the site index is between 75 and 80 feet. The yield from an unmanaged stand of loblolly pine, over a 50-year period, is approximately 330 board feet (Doyle Rule) per acre per year. Management can substantially increase this yield.

The high shrink-swell nature of this soil may cause sweep in trees; thus, this soil is better suited to short rotation management schemes. A high water table during the winter and spring months may restrict access. During wet periods, care must be taken to avoid excessive rutting and the use of roads should be limited. Traffic restrictions or vehicles with modified equipment, such as, wide or floatation tires and four-wheeled drive are recommended. Crowning and raising the roadbed is recommended, but must be designed so that natural drainage is not interrupted. The low strength characteristics of this soil limit its use for road material. The high available water holding capacity of this soil leads to a competition problem for new seedlings. Site preparation or release measures that control invading brush may be needed. The poor drainage may cause significant seedling mortality. Bedding and scheduling planting during the early part of the planting season should be considered. The clayey nature of this soil makes planting difficult, especially during wet or extremely dry conditions.

Bevil

This soil is on uplands and is suitable for the management of pine and hardwoods. Common trees of the overstory include loblolly pine, water oak, cherrybark oak, sweetgum, and green ash. The average site index for loblolly pine is 90 feet on a 50-year curve (60 feet on a 25-year curve), but can range from 85 to 95 feet. For oaks, the site index is between 75 and 80 feet. The yield from an unmanaged stand of loblolly pine, over a 50-year period, is approximately 330 board feet (Doyle Rule) per acre per year. Management can substantially increase this yield.

The high shrink-swell nature of this soil may cause sweep in trees; thus, this soil is better suited to short rotation management schemes. A high water table during the winter and spring months may restrict access. During wet periods, care must be taken to avoid excessive rutting and the use of roads should be limited. Traffic restrictions or vehicles with modified equipment, such as, wide or floatation tires and four-wheeled drive are recommended. Crowning and raising the roadbed is recommended, but must be designed so that natural drainage is not interrupted. The low strength characteristics of this soil limit its use for road material. The high available water holding capacity of this soil leads to a competition problem for new seedlings. Site preparation or release measures that control invading brush may be needed. The poor drainage may cause significant seedling mortality. Bedding and scheduling planting during the early part of the planting season should be considered.

Bienville

This soil is on stream terraces and is suitable for the management of pine. Common trees of the overstory include loblolly and shortleaf pine, southern red oak, sweetgum, and white ash. The average site index for loblolly pine averages 95 feet on a 50-year curve (64 feet on a 25-year curve), but can range from 90 to 100 feet.

The yield from an unmanaged stand of loblolly pine, over a 50-year period, is approximately 395 board feet (Doyle Rule) per acre per year. Management can substantially increase this yield.

The sandy nature of this soil limits equipment use, especially during dry periods. Traffic restrictions or vehicles with modified equipment, such as, wide tires and four-wheeled drive may be needed during these periods. Successful establishment of planted pine requires attention to proper planting depth, soil compaction around the roots, and herbaceous weed control. Planting should be done when the soil is moist. The control of herbaceous weeds should be started either during site preparation or as a release during the first growing season.

Bleakwood

This soil is on floodplains and may flood several times each year. It is better suited to the management of hardwoods. Common trees of the overstory include willow oak, cherrybark oak, sweetgum, and green ash. The average site index for bottomland oak and sweetgum, is 100 feet (50-year curve). The yield from an unmanaged stand of sweetgum, over a 50-year period, is approximately 310 board feet (Doyle Rule) per acre per year. Management can substantially increase this yield.

The hazard of flooding and the high water table associated with this soil limits access. During wet periods, care must be taken to avoid excessive rutting and the use of roads should be limited. Traffic restrictions or vehicles with modified equipment, such as, wide or floatation tires and four-wheeled drive are recommended. The number, type, and placement of roads and trails should be considered as part of the overall streamside management zone.

Camptown

This soil is on low uplands as stream scars and depressions. It is generally saturated during the cool season months and may be ponded from winter into spring. This soil has little commercial woodland potential. Common trees of the overstory include bald cypress, maple, tupelo, and Carolina ash. Flooding and a high water table during the winter and spring months excludes access. The wetland function of these areas should be considered when managing these soils.

Craigen

This soil is on uplands and is best suited to the management of pine. Common trees of the overstory include loblolly pine, water oak, white oak, sweetgum, and black gum. The site index for loblolly pine averages 90 feet on a 50-year curve (60 feet on a 25-year curve), but can range from 80 feet in northern Orange County to 100 feet in the Lawhorn Woods area of Jefferson County. The yield from an unmanaged stand of loblolly pine, over a 50-year period, is approximately 330 board feet (Doyle Rule) per acre per year. Management can substantially increase this yield.

The sandy nature of this soil limits equipment use, especially during dry periods. Traffic restrictions or vehicles with modified equipment, such as, wide tires and four-wheeled drive may be needed during these periods. Successful establishment of planted pine requires attention to proper planting depth, soil compaction around the roots, and herbaceous weed control. Planting should be done when the soil is moist. The control of herbaceous weeds should be started either during site preparation or as a release during the first growing season.

Estes

This soil is on a flood plain that floods several times each year. It is best suited to the management of hardwoods (fig. 25). Common trees of the overstory include willow oak, cherrybark oak, sweetgum, and green ash. The average site index for bottomland oaks and sweetgum is 90 feet (50-year curve), but ranges from 85 to 100 feet. The yield from an unmanaged stand of sweetgum, over a 50-year period, is approximately 210 board feet (Doyle Rule) per acre per year. Management can substantially increase this yield. The excess water can cause seedling mortality, and other management concerns.

The hazard of flooding will greatly limit access. Traffic restrictions will be needed for much of the year and vehicles with modified equipment, such as, wide or floatation tires and four-wheeled drive will be needed even during dry periods. Care must be taken to avoid excessive rutting. The number, type, and placement of roads and trails should be considered as part of the overall streamside management zone. The clayey nature of this soil makes planting difficult, especially during wet or extremely dry conditions.

Evadale

This soil is on low upland flats. It is suitable for the management of both pine and hardwood. Common trees of the overstory include loblolly pine, water oak, willow oak, sweetgum, green ash, and blackgum. The site index for loblolly pine is between 95 and 105 feet on a 50-year curve (64 to 72 feet on a 25-year curve). For oaks, the average site index is 90 feet. The yield from an unmanaged stand of loblolly pine, over a 50-year period, is approximately 460 board feet (Doyle Rule) per acre per year. Management can substantially increase this yield.

A high water table during the winter and spring months may restrict access. During wet periods, care must be taken to avoid excessive rutting and the use of roads should be limited. Traffic restrictions or vehicles with modified equipment, such as, wide or floatation tires and four-wheeled drive are recommended. Crowning and raising the roadbed is recommended, but must be designed so that natural drainage

Figure 25.—Bottomland hardwoods and dwarf palmetto on an area of Estes clay, 0 to 1 percent slopes, frequently flooded.

is not interrupted. Use of roads during wet periods will also be limited because of the low strength characteristic of this soil. Locate roads to avoid the depressions. Crowning and raising the roadbed may be needed, but must be designed so that natural drainage is not interrupted. Maintenance will be necessary. The low strength characteristics of this soil limit its use for road material. The high available water holding capacity of this soil leads to a competition problem for new seedlings. Site preparation or release measures that control invading brush may be needed. The poor drainage may cause significant seedling mortality. Bedding and scheduling planting during the early part of the planting season should be considered.

Fausse

This soil is in sloughs and ponded backswamps associated with the Sabine and Neches rivers. Frequent flooding and year round saturation limits the potential of this soil for commercial woodland production. Common trees of the overstory include bald cypress, overcup oak, maple, green and Carolina ash, and tupelo. The site index for overcup oak is approximately 65 feet (50-year curve). Flooding and the high water table will exclude access. The wetland function of these areas should be considered when managing these soils.

Gist

This soil occupies small mounds on uplands in complex with other soils. Individually, the size of these mounds makes this soil not suited to commercial woodland production. When considering the entire area that includes other soils, it is suited to the management of both pine and hardwood. Common trees of the overstory include loblolly pine, water oak, sweetgum, elm, and blackgum. The site index for loblolly pine and sweetgum averages 105 feet on a 50-year curve (72 feet for loblolly pine on a 25-year curve). The yield from an unmanaged stand of loblolly pine, over a 50-year period, is approximately 525 board feet (Doyle Rule) per acre per year. For sweetgum, the average yield is approximately 350 board feet (Doyle Rule) per acre per year. Management can substantially increase these yields.

There are no significant management concerns with this soil. However, management of these mounds is usually limited by the wetter intermound soils associated with this soil.

Labelle

This soil is on uplands and may include small mounds. Although it formed under prairie conditions, trees have encroached. For this reason, it may be considered suitable for the management of pine and hardwoods. Common trees of the overstory, when forested include loblolly pine, water oak, willow oak, elm, and green ash (fig. 26). The site index for loblolly pine is 90 feet on a 50-year curve (60 feet on a 25-year curve) but can range from 85 to 95 feet. For bottomland type oaks, the site index is 75 feet. The yield from an unmanaged stand of loblolly pine, over a 50-year period, is approximately 330 board feet (Doyle Rule) per acre per year. Management can substantially increase this yield.

The high shrink-swell nature of this soil may cause sweep in trees; thus, this soil is better suited to short rotation management schemes. A high water table during the winter and spring months may restrict access. During wet periods, care must be taken to avoid excessive rutting and the use of roads should be limited. Traffic restrictions or vehicles with modified equipment, such as, wide or floatation tires and four-wheeled drive are recommended. Crowning and raising the roadbed is recommended, but must be designed so that natural drainage is not interrupted. The low strength characteristics of this soil limit its use for road material. The high available water holding capacity of this soil leads to a competition problem for new seedlings. Site preparation or release measures that control invading brush may be

Figure 26.—Forest encroachment on an area of Labelle silt loam, 0 to 1 percent slopes.

needed. The clayey nature of the subsoil, which occurs near the surface, makes planting difficult, especially during wet or extremely dry conditions. Proper planting methods are important to minimize seedling mortality.

League

This soil is on uplands and although it formed under prairie conditions, trees have encroached. For this reason, it may be considered suitable for the management of pine and hardwoods. Common trees of the overstory, when forested include loblolly pine, water oak, willow oak, sweetgum, and green ash. The site index for loblolly pine is 85 feet on a 50-year curve (57 feet on a 25-year curve). For bottomland oaks, the site index is between 70 and 75 feet. The yield from an unmanaged stand of loblolly pine, over a 50-year period, is approximately 280 board feet (Doyle Rule) per acre per year. Management can substantially increase the yield.

The high shrink-swell nature of this soil may cause sweep in trees; thus, this soil is better suited to short rotation management schemes. A high water table during the winter and spring months may restrict access. During wet periods, care must be taken to avoid excessive rutting and the use of roads should be limited. Traffic restrictions or vehicles with modified equipment, such as, wide or floatation tires and four-wheeled drive are recommended. Crowning and raising the roadbed is recommended, but must be designed so that natural drainage is not interrupted. The low strength characteristics of this soil limit its use for road material. The high available water holding capacity of this soil leads to a competition problem for new seedlings. Site preparation or release measures that control invading brush may be needed. The poor drainage may cause significant seedling mortality. Bedding and scheduling planting during the early part of the planting season should be considered. The clayey nature of this soil makes planting difficult, especially during wet or extremely dry conditions.

Mollco

This soil is in depressions which pond water from the fall into the spring months. It is therefore best suited to the management of hardwoods. Common trees of the overstory include bald cypress, laurel oak, willow oak, and maple. The average site index for bottomland oaks is 70 feet. The yield from an unmanaged stand of bottomland oaks is approximately 280 board feet (Doyle Rule) per acre per year. Except for a short time during the summer months, wetness limits all use of equipment on this soil. Traffic restrictions or vehicles with modified equipment, such as, wide or floatation tires and four-wheeled drive will be needed even during dry periods. This soil is not suitable for road material.

Morey

This soil is on uplands and although it formed under prairie conditions, trees have encroached. For this reason, it may be considered suitable for the management of pine and hardwoods. Common trees of the overstory, when forested include loblolly pine, water oak, willow oak, sweetgum, and green ash. The site index for loblolly pine is 90 feet on a 50-year curve (60 feet on a 25-year curve), but can range up to 100 feet. For bottomland oaks, the site index is 75 feet. The yield from an unmanaged stand of loblolly pine, over a 50-year period, is approximately 330 board feet (Doyle Rule) per acre per year. Management can substantially increase this yield.

A high water table during the winter months may restrict access. During wet periods, care must be taken to avoid excessive rutting and the use of roads should be limited. Traffic restrictions or vehicles with modified equipment, such as, wide or floatation tires and four-wheeled drive are recommended. Crowning and raising the roadbed is recommended, but must be designed so that natural drainage is not interrupted. The low strength characteristics of this soil limit its use for road material. The high available water holding capacity of this soil leads to a competition problem for new seedlings. Site preparation or release measures that control invading brush may be needed.

Orcadia

This soil is on uplands and although it is a prairie soil, trees have encroached. For this reason, it may be considered suitable for the management of pine and hardwood. Common trees of the overstory, when forested include loblolly pine, water oak, willow oak, sweetgum, and green ash. The site index for loblolly pine is 90 feet on a 50-year curve (60 feet on a 25-year curve), but can range from 85 to 95 feet. For bottomland oaks, the site index is 75 feet. The yield from an unmanaged stand of loblolly pine, over a 50-year period, is approximately 330 board feet (Doyle Rule) per acre per year. Management can substantially increase this yield.

The high shrink-swell nature of this soil may cause sweep in trees. This makes it better suited to short rotation management schemes. A high water table during the winter months may restrict access. During wet periods, care must be taken to avoid excessive rutting and the use of roads should be limited. Traffic restrictions or vehicles with modified equipment, such as, wide or floatation tires and four-wheeled drive are recommended. Crowning and raising the roadbed is recommended, but must be designed so that natural drainage is not interrupted. The low strength characteristics of this soil limit its use for road material. The high available water holding capacity of this soil leads to a competition problem for new seedlings. Site preparation or release measures that control invading brush may be needed.

Spurger

This soil is on broad stream terraces. It is suitable for the management of both pine and hardwood. Common trees of the overstory include loblolly pine, shortleaf pine, water oak, cherrybark oak, sweetgum, blackgum, and ash. The site index for loblolly pine and sweetgum averages 105 feet on a 50-year curve (72 feet for loblolly pine on a 25-year curve). The yield from an unmanaged stand of loblolly pine, over a 50-year period, is approximately 525 board feet (Doyle Rule) per acre per year. For sweetgum, the average yield is pproximately 350 board feet (Doyle Rule) per acre per year. Management can substantially increase these yields.

Because the clayey subsoil is near the surface, access during wet periods may be restricted and attention must be made to planting methods to ensure proper planting depth. Wet weather traffic restrictions may be needed to prevent rutting.

Texla

This soil is on uplands of the flatwoods. It is suited to the management of pine and hardwoods. Common trees of the overstory include loblolly pine, water oak, sweetgum, and ash. The site index for loblolly pine is 90 feet on a 50-year curve (60 feet on a 25-year curve). For bottomland oaks, the sites index is 75 feet. The yield from an unmanaged stand of loblolly pine, over a 50-year period, is approximately 330 board feet (Doyle Rule) per acre per year. Management can substantially increase this yield.

A high water table during the winter months may restrict access. During wet periods, care must be taken to avoid excessive rutting and the use of roads should be limited. Traffic restrictions or vehicles with modified equipment, such as, wide or floatation tires and four-wheeled drive are recommended. Crowning and raising the roadbed is recommended, but must be designed so that natural drainage is not interrupted. The low strength characteristics of this soil limit its use for road material. The high available water holding capacity of this soil leads to a competition problem for new seedlings. Site preparation or release measures that control invading brush may be needed.

Vamont

This soil is on uplands and is suited to the management of pine and hardwoods. Common trees of the overstory include loblolly pine, water oak, white oak, sweetgum, and ash. The site index for loblolly pine is 90 feet on a 50-year curve (60 feet on a 25-year curve), but can range from 85 to 100 feet. For bottomland oaks, the site index is 75 feet. The yield from an unmanaged stand of loblolly pine, over a 50-year period, is approximately 330 board feet (Doyle Rule) per acre per year. Management can substantially increase this yield.

The high shrink-swell nature of this soil may cause sweep in trees; thus, this soil is better suited to short rotation management schemes. A high water table during the winter and spring months may restrict access. During wet periods, care must be taken to avoid excessive rutting and the use of roads should be limited. Traffic restrictions or vehicles with modified equipment, such as, wide or floatation tires and four-wheeled drive are recommended. Crowning and raising the roadbed is recommended, but must be designed so that natural drainage is not interrupted. The low strength characteristics of this soil limit its use for road material. The high available water holding capacity of this soil leads to a competition problem for new seedlings. Site preparation or release measures that control invading brush may be needed. The poor drainage may cause significant seedling mortality. Bedding and scheduling planting during the early part of the planting season should be considered. The clayey nature of this soil makes planting difficult, especially during wet or extremely dry conditions.

Viterbo

This soil is on uplands and is suited to the management of pine and hardwoods. Common trees of the overstory include loblolly pine, water oak, willow oak, cherrybark oak, sweetgum, and ash. The site index for loblolly pine is 95 feet on a 50-year curve (64 feet on a 25-year curve). For bottomland oaks, the site index is 83 feet. The yield from an unmanaged stand of loblolly pine, over a 50 year period, is approximately 395 board feet (Doyle Rule) per acre per year. Management can substantially increase this yield.

A high water table during the winter months may restrict access. During wet periods, care must be taken to avoid excessive rutting and the use of roads should be limited. Traffic restrictions or vehicles with modified equipment, such as, wide or floatation tires and four-wheeled drive are recommended. Crowning and raising the roadbed is recommended, but must be designed so that natural drainage is not interrupted. The low strength characteristics of this soil limit its use for road material. The high available water holding capacity of this soil leads to a competition problem for new seedlings. Site preparation or release measures that control invading brush may be needed.

Forestland Productivity and Management

The tables in this section 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.

Productivity

In table 8, the *potential productivity* of merchantable or *common trees* on a soil is expressed as a site index and as a volume number. 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. Commonly grown trees are those that forest managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability. More detailed information regarding site index is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet.

The *volume of wood fiber*, a number, is the yield likely to be produced by the most important tree species. This number, expressed as board feet per acre per year and calculated at the age of culmination of the mean annual increment (CMAI), indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Trees to manage are those that are preferred for planting, seeding, or natural regeneration and those that remain in the stand after thinning or partial harvest.

Management

In table 9, slight, moderate, and severe indicate the degree of 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 in 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 limitations reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting (fig. 27). 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 and season of use are 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 concerns 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.

Windthrow hazard is the likelihood that trees will be uprooted by the wind because the soil is not deep enough for adequate root anchorage. The main restrictions that affect rooting are a seasonal high water table and the depth to bedrock, a fragipan, or other limiting layers. A rating of *slight* indicates that under normal conditions no trees are blown down by the wind. Strong winds may damage

Figure 27.—Recently harvested forest on an area of Evadale silt loam, 0 to 1 percent slopes.

trees, but they do not uproot them. A rating of *moderate* indicates that some trees can be blown down during periods when the soil is wet and winds are moderate or strong. A rating of *severe* indicates that many trees can be blown down during these periods.

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 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.

Recreation

The soils of the survey area are rated in table 10 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public 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 recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In the table 10, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or a combination of these measures.

The information in the table can be supplemented by other information in this survey, for example, interpretations for dwellings without basements and for local roads and streets in table 12 and interpretations for septic tank absorption fields in table 13.

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

Bill Deauman, wildlife biologist, helped to prepare this section

Jefferson and Orange Counties provide habitat for a multitude of native and migratory animals including neotropical birds, waterfowl, shorebirds, wading birds, raptors, saltwater and freshwater fishes, and furbearers. The area has coastal marshes, coastal prairies, and coastal forests or flatwoods. The coastal marshes are generally wet to permanently wet, very saline to fresh areas along the coast that produce a tremendous amount of forage that is utilized by a large variety of wildlife. The coastal prairies are somewhat drier and are extensively cultivated and grazed. The cropland areas also provide good habitat and food for wildlife. The flatwoods have a variety of tree species mixed with cleared areas that provide habitat for numerous forested wildlife species. Bottomland areas are interspersed within the coastal prairie and the flatwoods, which increases habitat diversity. The diversity created by the close proximity of these diverse habitat types provides a tremendous environment for wildlife.

History

The first explorers discovered tall grasses, standing water, and flat topography. Low-lying sandy ridges and swales along the coast served as a buffer between the Gulf of Mexico and the mainland. More inland were large shallow bays like Sabine Lake that ranged from saline to fresh. Immediately inland from the bays was a tidally influenced zone of brackish to saline marsh that graded into fresh marshes. Further inland were extensive tall grass prairies and wooded areas.

The flat topography in the survey area greatly restricts water drainage. After rain storms, large sheets of slow moving water historically flooded areas that remained for weeks to months. Some areas remained inundated until evaporation finally removed the standing water.

Hurricanes periodically strike the area and can cause drastic changes for wildlife. The plant community can be dramatically changed also. For instance, freshwater plant communities in close proximity to the coast become covered by saline tidal water and are killed. Although these plants eventually recover, the wildlife dependent on these plants is devastated. Hurricane forces can wash away bare soil in areas of the marsh with soils that are fluid, semi-fluid, or have organic surfaces. Thus, the fragile environment is destroyed and may not fully recover. If plants do not get established, these areas may eventually become an open water body. This process is accelerated with salt-water intrusions.

Agriculture has had a big impact on wildlife. The majority of the upper Texas Coast remained a wilderness during the early to mid-1800s. From the late 1800s to the mid-1900s, much of the virgin prairie was converted to agricultural production.

During this period, the area experienced a rapid expansion into cotton and rice farming and some of the first large cattle operations started near Sabine Pass.

In the early 1900s, water delivery systems were developed for the rapidly increasing rice industry. Natural waterways were altered to better deliver water to the rice growing areas and for navigation. In addition, significant areas were artificially drained to facilitate the growing of crops or pasture. These changes significantly altered the wildlife in the area. Drainage allowed water to come off readily from the coastal prairies and upland marshes, but in some cases it provided a way for salt water to easily enter these areas from high tides, hurricanes, and wind. With the loss of these native areas, some fish and wildlife have suffered. However, the effects of this loss of natural habitat have been offset by rice production which is important habitat for waterfowl and other wetland animals and birds.

Wildlife in the Marsh and Prairie

The marsh and prairie are home to a diverse number of wildlife species. The red wolf, a little known canine, once ranged over much of the Coastal Prairie. The decline of the species may be related to the increase in human activity from the 1800s to modern time. Land use changes and predator control activities increased during this time. As wolf numbers declined, coyotes rapidly moved into portions of the red wolf's range. By 1967, hybridization with coyotes resulted in the red wolf being placed on the Federally Endangered List, and a pure red wolf in the area is unlikely.

The American Alligator, once on the list of threatened wildlife, has responded favorably to protection and habitat management. Today, alligator numbers have expanded sufficiently to allow a state regulated hunting season on them in the area. Limited animals are harvested each fall by sportspersons and landowners in this survey area.

Freshwater fishes are abundant in the fresh bays, marshes, canals, and drains. Largemouth bass, sunfish, catfish, gar, carp, and minnows are the most common species. The soils, available water, and long growing season provide an excellent opportunity for intensive fisheries management and commercial fish production to be implemented. Many ponds and reservoirs are used in combination for fish culture, waterfowl, and irrigation water. A limiting factor to the area fisheries is the profuse growth of aquatic plants. If not controlled, these plants can take over fisheries and severely limit oxygen supply and growing space. The most common aquatic plant is water hyacinth.

Marine fisheries incorporate uniqueness to the saltwater influenced portions of Jefferson and Orange Counties. Some of the more important saltwater species are speckled trout, redfish, southern flounder, and blue crab. This abundance of marine life provides the area with many fishing opportunities. The interconnecting of fresh-to-brackish-to-salt water marshes is vital to many saltwater species as a nursery and feeding area. In some areas, human influence has had a dramatic impact on the flow of water through the marsh system and some areas that were once fresh are now brackish or salty.

Furbearers consist of muskrat, nutria, mink, otter, and raccoon. Historically, these furbearers have provided thousands of dollars in revenue each year through hunting and trapping. The muskrat inhabits primarily the brackish marsh with the favorite forage being Scirpus (three-square grass). Nutria prefer fresher water and are opportunistic feeders. Muskrat and nutria numbers periodically explode, which cause existing perennial vegetation to be replaced by annual plants. Marsh areas are susceptible to erosion when hurricanes occur.

Many types of birds use the area. Neotropical migratory birds, raptors, and other migratory birds favor the area for resting and feeding before and after migrating in the fall and spring. The marshes, woods, and grasslands offer diverse habitats for many types of nonmigratory birds. Geese and ducks use the marshland, rice fields, and other wetlands as habitat. These areas offer abundant food from natural plants, waste seed from rice, and winter annual ryegrass plantings. Flooded freshwater areas are extremely important to waterfowl. In dry years, open fresh water can become scarce and contaminated water can quickly kill thousands of waterfowl.

Wildlife in the Flatwoods

The northern areas of Jefferson and Orange Counties are unique woodlands and support a variety of wildlife species. These forests are part of the area known as the Big Thicket. The vegetative communities are generally divided into four types. They include flood plain forest, baygall, and cypress sloughs; flatwoods and palmetto hardwoods; savannah; and mixed hardwood-pine forest.

The Big Thicket is the home of 85 tree species, more than 60 shrubs, and 1,000 flowering plants. Nearly 186 kinds of birds and fifty reptile species live in the area.

Many ponds and lakes are found in these woods and are stocked and managed for largemouth bass, channel and blue catfish, crappie, and bluegill. Many small ponds are stocked with channel catfish and fathead minnows. Other species found in streams and sloughs include freshwater drum, flathead catfish, bullhead catfish, carp, gars, bowfin, buffalofish, white bass, gizzard shad, various sunfish, and white and black crappie.

The major game species in these woodlands are white-tailed deer, fox and gray squirrels, and ducks. Bobwhite quail are hunted but not locally abundant. Raccoon, opossum, skunks, armadillo, cottontail rabbit, swamp rabbit, and numerous rodents, and songbirds inhabit the areas. Common predators are coyote, gray fox, bobcat, hawks, and owls.

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

In table 11, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

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

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

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

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, flooding, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, clover, and alfalfa.

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

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 black cherry and crabapple.

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, cedar, and juniper.

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. An example of a shrub is American beautyberry.

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 and slopes. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cordgrass, rushes, sedges, and reeds.

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

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

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, pheasant, 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, ruffed grouse, 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, and mink (fig. 28).

Habitat for rangeland wildlife consists of areas of shrubs and wild herbaceous plants. Wildlife attracted to rangeland include pheasant, deer, meadowlark, and lark bunting.

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

Figure 28.—Snow geese gathering in a harvested rice field on League clay, 0 to 1 percent slopes. Landowners often flood fields to provide for wildlife habitat in the fall.

most limiting features are identified. Ratings are given for 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.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds 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 evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

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

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

Building Site Development

Table 12 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

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

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, 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 13 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.

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.

The table shows 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 resulting from rapid permeability in 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 concerns, 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 should be considered.

The ratings in the table 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 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 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 wind erosion.

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 the final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 14 shows 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. Table 16 shows engineering index properties which provides detailed information about each soil layer. This information can help to 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 have a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In the table, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are the 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 shown in table 16.

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 15 shows information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and 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 shows the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

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

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction. Levees, as used for rice production, are not included with this type of interpretation.

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 the potential for 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, and 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. Irrigation of rice is not included in this interpretation.

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 wind erosion or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

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

Soil Properties

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

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. These results are reported in Table 24.

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 and verify soil properties that cannot be estimated accurately by field observation, and help to 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 16 shows 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 the heading "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 (2) and the system adopted by the American Association of State Highway and Transportation Officials (1).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, 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. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 16.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

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

The estimates of grain-size distribution, liquid limit, and plasticity index are 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 Soil Properties

Table 17 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In the table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In the table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

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

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, 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 1/3- or 1/10-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each 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 linear extensibility, 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. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Saturated hydraulic conductivity refers to the ability of a soil to transmit water or air. The term "permeability," as used in soil surveys, indicates saturated hydraulic conductivity (K-sat). The estimates in the table indicate the rate of water movement, in micrometers per second, 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 and septic tank absorption fields.

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 soil layer. The capacity varies, depending on soil properties that affect retention of water. 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.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In the table, 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 by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the table as the K factor (Kw and Kf) and the T factor. 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) and the Revised Universal Soil Loss Equation (RUSLE) 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 and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

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.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the "National Soil Survey Handbook," which is available in local offices of the Natural Resources Conservation Service or on the Internet.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.

2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.

5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.

8. Soils that are not subject to wind erosion because of coarse fragments on the surface or because of surface wetness.

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Chemical Soil Properties

Table 18 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable bases 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. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Effective cation-exchange capacity refers to the sum of extractable bases plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil 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.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced permeability and aeration, and a general degradation of soil structure.

Water Features

Table 19 shows estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, 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 and very 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 to very 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 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.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. The table indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely gray colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates surface water depth and the duration and frequency of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and very long if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

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

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

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 little or no horizon development.

Also considered is 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.

Soil Features

Table 20 shows estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally 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. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes 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 results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete 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 also is expressed as *low, moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Physical, Chemical, and Clay Mineralogy Analyses of Selected Soils

The results of physical analyses of several typical pedons in the survey area are shown in Table 21 and the results of chemical analyses in Table 22. The results of clay mineralogy analyses are given in Table 23. The data are for soils sampled at carefully selected sites. Unless otherwise indicated, the pedons are typical of the series. They are described in the section "Soil Series and Their Morphology." Soil samples were analyzed by the USDA-NRCS National Soil Survey Laboratory, Lincoln, Nebraska.

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 methods published in Soil Survey Investigations Report 42. (14) (15)

Sand—(0.05- to 2.0-millimeter fraction) weight percentages of material less than 2 millimeters (3A1).

Silt—(0.002- to 0.05-millimeter fraction) pipette extraction, weight percentages of all material less than 2 millimeters (3A1).

Clay—(fraction less than 0.002 millimeters) pipette extraction, weight percentages of material less than 2 millimeters (3A1).

Bulk density—of less than 2-millimeter material, saran-coated clods field moist (3B1a), 1/3 bar (3B1b), ovendry (3B1c).

Water retained—pressure extraction, percentage of ovendry weight of less than 2-millimeter material; 1/3 or 1/10 bar (3C1), 15 bars (3C2).

Extractable bases—ammonium acetate pH 7.0, ICP; calcium (6N2e, 6N2f), magnesium (6O2d, 6O2e), sodium (6P2b, 6P2c), potassium (6Q2b, 6Q2c).
Cation-exchange capacity—sum of cations (4B4b1).
Base saturation—ammonium acetate, pH 7.0 (4B4c1).
Organic carbon—wet combustion. Walkley-Black modified acid-dichromate, ferric sulfate titration (6A1c, obsolete).
Reaction (pH)—1:1 water dilution (4C1a2a1).
Electrical conductivity—saturation extract (4F2b1).
Sodium adsorption ratio (4F3b).
Exchangeable sodium percentage (ESP)—(5D)
Carbonate as calcium carbonate—(fraction less than 2 millimeters [80 mesh]) manometric (6E1g).
X-ray diffraction of clay minerals (7A2).

Engineering Index Test Data

Table 24 shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are representative of the series described in the section "Soil Series and Their Morphology." The soil samples were tested by USDA NRCS, National Soil Survey Laboratory, Lincoln, Nebraska.

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

The tests and methods are Mechanical analysis—T 88 (AASHTO), D 422 (ASTM), D 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 4318 (ASTM); Plasticity index—T 90 (AASHTO), D 4318 (ASTM).

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Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories. (16) 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 25 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

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

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

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludalfs (Hapl, meaning minimal horizonation, plus udalf, the suborder of the Alfisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup 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 taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective Typic identifies the subgroup that typifies the great group. An example is Typic Hapludalfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. 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, mineral content, soil temperature regime, soil depth, and reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, nonacid, thermic Typic Hapludalfs.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each 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". (18) Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (17) and in "Keys to Soil Taxonomy".

(17) Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Allemands Series

The Allemands series consists of very deep, very poorly drained, very slowly permeable nonsaline soils that formed in unconsolidated organic sediments underlain by firm clayey sediments that are permanently saturated with water. These soils are in marshes. Slopes are 0 to 1 percent. The soils of the Allemands series are clayey, smectitic, euic, hyperthermic Terric Haplosaprists.

Typical pedon of Allemands mucky peat, 0 to 1 percent slopes, frequently flooded, tidal; Jefferson County, Texas; from the intersection of Texas Highway 82 and Texas Highway 73, 10 miles west on Texas Highway 73, 1.6 miles generally southeast on private road, 0.75 miles southeast on private road, 0.55 mile south on private road and 75 feet west of road in marsh. (lat. 29 degrees 49 minutes 41 seconds N. and long. 94 degrees 05 minutes 35 seconds W.)

Oe—0 to 10 inches; very dark gray (10YR 3/1) mucky peat; very dark grayish brown (10YR 3/2) pressed and rubbed; about 50 percent fiber, about 30 percent rubbed; massive; flows easily between fingers and leaves small residue in hand when squeezed (n value of more than 2.0); estimated 50 percent fibric material, 30 percent hemic, and 10 percent sapric material; many fine to coarse roots; strongly acid; clear smooth boundary.

Oa—10 to 18 inches; very dark gray (10YR 3/1) muck; very dark gray (10YR 3/1) pressed and rubbed; about 20 percent fiber, about 17 percent rubbed; massive; flows easily between fingers and leaves small residue in hand when squeezed (n value of more than 2.0); estimated 20 percent fibric material, 40 percent hemic, and 10 percent sapric material; many fine and medium roots; strongly acid; clear smooth boundary.

Ag—18 to 28 inches; very dark gray (10YR 3/1) clay; weak moderate prismatic structure; very hard, very hard, very sticky, plastic; slightly acid; gradual wavy boundary.

Cg1—28 to 39 inches; gray (10YR 5/1) clay; massive; very hard, very firm, very sticky, plastic; few fine prominent light olive brown (2.5Y 5/6) iron-manganese concentrations; slightly acid; gradual wavy boundary.

Cg2—39 to 55 inches; gray (2.5Y 6/1) clay; massive; very hard, very firm, very sticky, plastic; few fine prominent light olive brown (2.5Y 5/6) iron-manganese concentrations; few manganese concretions up to 5 millimeters; neutral; gradual wavy boundary.

Cg3—55 to 80 inches; gray (2.5Y 6/1) clay; massive; very hard, very firm, very sticky, plastic; common fine prominent light olive brown (2.5Y 5/6) iron-manganese concentrations; few manganese concretions up to 5 millimeters; few pitted calcium carbonate concretions up to 5 centimeters; neutral.

Thickness of the organic materials ranges from 16 to 51 inches. The organic fraction is dominantly herbaceous materials. Reaction of the organic material ranges from strongly acid to slightly alkaline.

The surface tier, 0 to 10 inches, has hue of 7.5YR or 10YR, or is neutral, value of 2 to 4, and chroma of 1 to 3. After rubbing, the surface tier has a fiber content ranging from less than 1/10 to more than 4/10 of the organic volume, where there is no mineral horizon more than 16 inches thick with an upper boundary in the 12- to 36-inch zone. Where a mineral layer has an upper boundary in the 16- to 36-inch zone, the fiber content of the surface layer is such that a dominant part of the organic portion of the profile will have fiber content of less than 1/10 the organic volume. The mineral content ranges from 15 to 40 percent and it is dominantly clay, but includes thin strata of loamy material in some pedons. Reaction of the 10-inch surface tier ranges from strongly acid to slightly alkaline.

The subsurface tier, 10 to 18 inches, has hue of 5YR to 10YR, value of 2 to 4, and chroma of 1 to 3. The dominant layers of the organic portion of the subsurface tier have a fiber content of less than 1/10 the organic volume. Mineral content ranges from 20 to 50 percent. Reaction ranges from slightly acid to slightly alkaline.

The Ag horizon, where present, has hue of 10YR to 5Y, value of 2 to 5, and chroma of 1. Texture is clay or mucky clay containing from 60 to 95 percent clay. Reaction ranges from slightly acid to slightly alkaline.

The Cg horizon has hue of 10YR to 5Y, 5G, or 5GY, value of 3 to 6, and chroma of 1 or 2 or is neutral with value of 3 to 6. Texture ranges from fine sandy loam or mucky sandy loam to clay or mucky clay. Reaction ranges from slightly acid to slightly alkaline. Calcium carbonate concretions range from none to few. Iron-manganese concentrations range from none to few.

Anahuac Series

The Anahuac series consists of very deep, moderately well drained, very slowly permeable soils. These nearly level to very gently sloping soils formed in loamy and clayey sediments. These soils are on prairies. Slope ranges from 0 to 2 percent. The soils of the Anahuac series are fine, mixed, active, hyperthermic Oxyaquic Glossudalfs.

Typical pedon of Anahuac very fine sandy loam, 0 to 2 percent slopes (fig. 29); Jefferson County, Texas; from the intersection of Interstate Highway 10 and U.S. Highway 90 in Beaumont, 12.2 miles west on U.S. Highway 90, 1.0 mile north on North China Road, 0.6 mile west on paved county road, 0.3 mile north on private road and 50 feet east in field. (lat. 30 degrees 04 minutes 01 seconds N. and long. 94 degrees 20 minutes 53 seconds W.)

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) very fine sandy loam; weak fine subangular blocky structure; slightly hard, very friable; few very fine and fine roots; few very fine and fine pores; very strongly acid; clear smooth boundary.

A—7 to 14 inches; dark brown (10YR 3/3) loam; weak fine and medium subangular blocky structure; slightly hard, friable; few fine roots; few very fine and fine pores; strongly acid; clear smooth boundary.

E—14 to 18 inches; brown (10YR 4/3) loam; weak fine and medium subangular blocky structure; slightly hard, friable; few fine roots; common very fine and fine pores; very strongly acid; clear smooth boundary.

E/Bt—18 to 22 inches; grayish brown (10YR 5/2) loam (E); 15 to 20 percent fine and medium distinct yellowish brown (10YR 5/4) loam (Bt); weak fine and medium subangular blocky structure; slightly hard, very friable; few fine roots; many very fine and fine pores; few fine prominent strong brown (7.5YR 5/8) iron concentrations; very strongly acid; abrupt smooth boundary.

Bt1—22 to 33 inches; dark gray (10YR 4/1) clay; strong coarse prismatic structure parting to strong medium angular blocky; very hard, very firm; few fine roots; common fine and few medium pores; common distinct gray (10YR 5/1) clay films on faces of peds; common fine prominent red (10R 4/8) iron concentrations; very strongly acid; gradual smooth boundary.

Bt2—33 to 41 inches; dark gray (10YR 4/1) clay; moderate coarse prismatic structure parting to moderate fine and medium angular blocky; very hard, very firm; few fine roots; few fine pores; common distinct gray (10YR 5/1) clay films on faces of peds; many pressure faces; common fine prominent red (10R 4/6) and few fine prominent yellowish brown (10YR 5/6) iron concentrations; strongly acid; gradual smooth boundary.

Figure 29.—Profile of Anahuac very fine sandy loam, 0 to 2 percent slopes. A plow layer is at a depth of 6 inches and the E horizon extends to a depth of 10 to 20 inches where the clayey subsoil begins. The dark vertical streaks in the subsoil are crayfish krotovinas filled with loamy surface material.

Btg—41 to 54 inches; light brownish gray (2.5Y 6/2) clay loam; moderate coarse prismatic structure parting to weak fine and medium angular blocky; very hard, very firm; few fine roots; few fine and medium pores; common distinct (10YR 5/1) gray clay films on faces of peds; common fine prominent brownish yellow (10YR 6/8) and common fine prominent red (10R 4/6) iron concentrations; strongly acid; clear smooth boundary.

Bt/E1—54 to 63 inches; light brownish gray (10YR 6/2) loam (Bt); moderate coarse prismatic structure parting to weak fine and medium angular blocky; hard, firm; few fine roots; few fine and medium pores; few faint light gray (10YR 7/1) clay films on faces of peds; common fine and medium prominent yellowish brown (10YR 5/6), common fine and medium prominent red (10R 4/8), and common fine distinct reddish yellow (7.5YR 6/8) iron concentrations; 15 to 20 percent light gray (10YR 7/2) very fine sandy loam (E) clay depletions; moderately acid; diffuse smooth boundary.

Bt/E2—63 to 80 inches; light gray (10YR 7/1) loam; weak coarse prismatic structure parting to weak moderate subangular blocky; hard, firm; few fine roots; few fine and medium pores; many fine and medium prominent reddish yellow (7.5YR 6/6) and common fine prominent reddish brown (2.5YR 4/4) iron concentrations; 20 percent light gray (10YR 7/2) very fine sandy loam (E) clay depletions; few fine and medium iron-manganese stains on faces of peds; slightly acid.

The thickness of the solum is more than 80 inches. Base saturation is less than 50 percent in some subhorizon below the mollic epipedon and typically ranges from 20 to 45 percent. Weighted average clay content of the particle-size control section ranges from 35 to 50 percent. The lower part of the E and the E/Bt horizon is saturated for 2 weeks to 30 or more days following periods of heavy rainfall, mainly during winter and early spring. These soils do not have aquic conditions in most years. Depth to the argillic horizon ranges from 18 to 38 inches.

The thickness of the A horizon is 10 to 20 inches. The A horizon has hue of 10YR, value of 3, and chroma of 1 to 3. Texture is silt loam, loam, or very fine sandy loam. Reaction ranges from very strongly acid to slightly acid.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4. Iron concentrations range from few to common in shades of red, yellow, or brown. Texture is silt loam, loam, or very fine sandy loam. Reaction ranges from very strongly acid to slightly acid.

The glossic horizon or E/Bt horizon, present in most pedons, has hue of 10YR, value of 4 to 6, and chroma 2 to 6. Reaction ranges from very strongly acid to slightly acid.

The Bt and Btg horizons have hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. Texture is silty clay or clay and ranges to clay loam in the lower part. Iron concentrations range from few to common in shades of red, yellow, or brown. Reaction ranges from very strongly acid to moderately acid.

The Bt part of the Bt/E horizons has hue of 10YR or 2.5Y, value 5 to 7, and chroma 1 to 6. Texture is loam, sandy clay loam, or clay loam. The E part has hue of 10YR, value 5 to 7, and chroma 1 to 3. Some pedons have matrix colors mixed in shades of gray, brown, or yellow. Iron concentrations range from few to many in shades of red, yellow, brown, or olive. Iron depletions range from few to many in shades of gray. Reaction ranges from strongly acid to slightly acid.

Some pedons have a BC horizon below 70 inches. Color, texture, and reaction range is the same as the Bt/E horizon.

Aris Series

The Aris series consists of very deep, poorly drained, very slowly permeable soils that formed in loamy and clayey sediments. These soils are in depressions on broad prairies. Slopes are 0 to 1 percent, but typically less than 1 percent. The soils of the Aris series are fine, smectitic, hyperthermic Typic Glossaqualfs.

Typical pedon of Aris in Anahuac-Aris complex, 0 to 1 percent slopes; Jefferson County, Texas; from the west city limits of Port Arthur on Texas Highway 73, 5.8 miles west on Texas Highway 73 to intersection of Country Club Road, 0.3 mile north on Country Club Road and 200 feet east in pasture. (lat. 29 degrees 51 minutes 11 seconds N. and long. 94 degrees 08 minutes 03 seconds W.)

A—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam; weak fine and medium subangular blocky structure; hard, friable; common fine and few medium roots; common fine and medium vesicular and tubular pores; common fine and medium prominent strong brown (7.5YR 5/6) iron concentrations with clear boundaries on faces of peds and along root and pore channels; 10 percent crawfish krotovina filled with thin, alternating horizontal bands of dark grayish brown (10YR 4/2), grayish brown (10YR 5/2), and light brownish gray (10YR 6/2) silt loam and silty clay loam; few wormcasts; very strongly acid; clear smooth boundary.

E/Btg—6 to 14 inches; 60 percent light brownish gray (10YR 6/2) silty clay loam (E); weak fine and medium subangular blocky structure; hard, friable; common very fine and fine roots; common fine and medium vesicular and tubular pores; 40 percent dark gray (10YR 4/1) silty clay loam (Bt) that has common fine and medium prominent strong brown (7.5YR 5/6 and 7.5YR 5/8) iron concentrations with clear boundaries; 10 percent crawfish krotovina filled with thin, alternating horizontal bands of dark grayish brown (10YR 4/2), grayish brown (10YR 5/2), and light brownish gray (10YR 6/2) silt loam and silty clay loam; few wormcasts; very strongly acid; clear wavy boundary.

Btg/E1—14 to 18 inches; 60 percent dark gray (10YR 4/1) silty clay (Bt); weak medium prismatic structure parting to moderate medium angular blocky; hard, friable; few very fine and fine roots; common fine and medium vesicular and tubular pores; few thin very dark gray (10YR 3/1) clay films on faces of peds;

common fine and medium prominent strong brown (7.5YR 5/6) iron concentrations with clear boundaries; 40 percent light brownish gray (10YR 6/2) silt loam (E) that consists of albic materials 10 to 20 millimeters wide between peds resulting from aquic conditions; 15 percent crawfish krotovina filled with thin, alternating horizontal bands of dark grayish brown (10YR 4/2), grayish brown (10YR 5/2), and light brownish gray (10YR 6/2) silt loam and silty clay loam; very strongly acid; gradual wavy boundary.

Btg/E2—18 to 23 inches; 85 percent dark gray (10YR 4/1) silty clay (Bt); weak medium prismatic structure parting to moderate medium angular blocky; hard, friable; few very fine and fine roots common fine and medium vesicular and tubular pores; few thin very dark gray (10YR 3/1) clay films on faces of peds; common fine and medium prominent yellowish brown (10YR 5/6) iron concentrations with clear boundaries; 15 percent light brownish gray (10YR 6/2) silt loam (E) that consists of albic materials 10 to 20 millimeters wide between peds resulting from aquic conditions; few iron-manganese concretions 1 to 3 millimeters in diameter; 15 percent crawfish krotovina filled with thin, alternating horizontal bands of light brownish gray (10YR 6/2) and dark grayish brown (10YR 4/2) silt loam and silty clay loam; very strongly acid; gradual wavy boundary.

Btg1—23 to 30 inches; gray (10YR 5/1) clay; weak medium prismatic structure parting to moderate medium angular blocky structure; hard, friable; few very fine and fine roots; few fine vesicular and tubular pores; few thin dark gray (10YR 4/1) clay films on faces of peds; many fine and medium prominent yellowish brown (10YR 5/8) and red (2.5YR 4/6) iron concentrations with sharp boundaries; few iron-manganese concretions 1 to 3 millimeters in diameter; 3 percent streaks and pockets of light brownish gray (10YR 6/2) albic materials 5 to 10 millimeters wide between peds extend through the horizon; 10 percent crawfish krotovina filled with thin, alternating horizontal bands of light brownish gray (10YR 6/2) and dark grayish brown (10YR 4/2) silt loam; strongly acid; gradual wavy boundary.

Btg2—30 to 51 inches; light brownish gray (10YR 6/2) clay; weak medium prismatic structure parting to moderate medium angular blocky; very hard, firm; few very fine roots; few fine vesicular and tubular pores; few distinct dark gray (10YR 4/1) clay films on faces of peds; many fine, medium, and coarse prominent yellowish brown (10YR 5/6) and red (2.5YR 4/6) iron concentrations with sharp boundaries; few pressure faces; few iron-manganese concretions 1 to 3 millimeters in diameter; 2 percent streaks and pockets of light brownish gray (10YR 6/2) albic materials 5 to 10 millimeters wide between peds extend through the horizon; 10 percent crayfish krotovina filled with thin, alternating horizontal bands of light brownish gray (10YR 6/2) and dark grayish brown (10YR 4/2) silt loam and silty clay loam; moderately acid; diffuse wavy boundary.

Btg3—51 to 72 inches; light gray (2.5Y 7/2) clay; weak coarse subangular blocky structure; very hard, very firm; few pressure faces; few thin dark grayish brown (10YR 4/2) clay films on faces of peds; many fine and medium prominent yellowish brown (10YR 5/8), many medium and coarse prominent brownish yellow (10YR 6/6) and common fine and medium prominent pale brown (10YR 6/3) iron concentrations with clear boundaries; few iron-manganese concretions 1 to 3 millimeters in diameter; 10 percent crawfish krotovina filled with thin alternating horizontal bands of grayish brown (10YR 6/2) and dark grayish brown (10YR 4/2) silt loam and silty clay loam; slightly acid; diffuse wavy boundary.

Btg4—72 to 80 inches; light gray (2.5Y 7/1) clay; weak coarse subangular blocky structure; very hard, very firm; few pressure faces; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine and medium prominent pale brown (10YR 6/3), fine and medium prominent yellowish brown (10YR 5/8), and medium and coarse prominent brownish yellow (10YR 6/6) iron concentrations with sharp boundaries; few iron-manganese concretions 1 to 3 millimeters in diameter; 10 percent crawfish krotovina filled with thin alternating horizontal bands of light grayish brown (10YR 6/2) and dark grayish brown (10YR 4/2) silt loam and silty clay loam; neutral.

The thickness of the solum is more than 80 inches. Weighted average clay content of the particle-size control section ranges from 35 to 45 percent. The glossic horizon ranges from 10 to 30 inches thick. Sodium adsorption ratio (SAR) ranges from 0 to 4 within 40 inches of the surface and 0 to 6 in layers deeper than 40 inches.

The A horizon has hue of 10YR, value of 3 to 6, and chroma of 1 or 2. Horizons with value of 3 and chroma of 1 or 2 are less than 6 inches thick. Texture is most commonly silt loam, but includes fine sandy loam and loam. Iron concentrations in shades of brown range from none to common. Reaction ranges from very strongly acid to slightly acid.

The E horizon, present in some pedons, has hue of 10YR, value of 4 to 7, and chroma of 1 or 2. Texture is most commonly silt loam, but includes fine sandy loam and loam. Iron concentrations in shades of yellow or brown range from few to common. Reaction ranges from very strongly acid to slightly acid.

The E part of the E/Btg horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2. The Btg part of the E/Btg horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. Iron concentrations in shades of red, yellow, or brown range from common to many. Texture is silty clay loam or clay loam. Reaction ranges from very strongly acid to slightly acid.

The Btg part of the Btg/E horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. The E part of the Btg/E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. Iron concentrations in shades of red, yellow, or brown range from common to many. Texture is silty clay, silty clay loam, or clay loam. Albic materials (E) range from 15 to 40 percent. Reaction ranges from very strongly acid to slightly acid.

The Btg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. Iron concentrations in shades of red, yellow, or brown range from common to many. Texture is mainly clay but ranges to clay loam or silty clay loam. Streaks and pockets of albic material range from 0 to 10 percent. Reaction ranges from very strongly acid to neutral.

Baines Series

The Baines series consists of very deep, very poorly drained, very slowly permeable soils that formed in clayey and sandy sediments. These soils are in channel depressions associated with coastal ridges. Slopes are 0 to 1 percent. The soils of the Baines series are clayey over sandy or sandy-skeletal, smectitic, hyperthermic Typic Endoaquolls.

Typical pedon of Baines clay in an area of Sabine-Baines complex, 0 to 2 percent slopes; from the intersection of U.S. Highway 87 and Farm Road 3322 in Sabine Pass, 1.5 miles southwest on U.S. Highway 87, 0.35 mile northwest on private road to pasture gate and 700 feet southwest in range. (lat. 29 degrees 43 minutes 04 seconds N. and long. 93 degrees 55 minutes 00 seconds W.)

A—0 to 12 inches; black (10YR 2/1) clay; weak medium subangular blocky structure; extremely hard, very firm, sticky, plastic; many fine and medium roots; slightly saline; slightly alkaline; clear smooth boundary.

Bg1—12 to 16 inches; gray (10YR 5/1) clay loam; weak medium subangular blocky structure; hard, firm, slightly sticky, slightly plastic; common fine and medium roots; common medium distinct yellowish brown (10YR 5/4) iron concentrations; 2 percent concretions of calcium carbonate; slightly saline; moderately alkaline; abrupt smooth boundary.

Bg2—16 to 33 inches; 70 percent grayish brown (10YR 5/2) and 20 percent brown (10YR 5/3) clay loam; weak medium subangular blocky structure; hard, friable, slightly sticky, slightly plastic; common fine and medium roots; common medium distinct strong brown (7.5YR 5/8) iron concentrations; 1 percent concretions of calcium carbonate throughout, increasing to 4 percent in a 1 inch thick layer at lower boundary; slightly saline; very slightly effervescent; moderately alkaline; clear smooth boundary.

2Bg1—33 to 48 inches; light brownish gray (10YR 6/2) loamy fine sand; massive; soft, very friable, nonsticky, nonplastic; few fine roots; common medium distinct yellowish brown (10YR 5/8) iron concentrations; few masses of iron-manganese; few shell fragments; slightly saline; slightly alkaline; clear smooth boundary.

2Bg2—48 to 80 inches; 40 percent strong brown (7.5YR 5/6), 30 percent gray (10YR 6/1), and 30 percent grayish brown (10YR 5/2) loamy fine sand; massive; soft, very friable, nonsticky, nonplastic; few shell fragments; slightly saline; slightly alkaline.

The thickness of the solum is more than 80 inches. Depth to the sandy 2B horizon ranges from 20 to 35 inches. The clay content of the clayey portion of the particle-size control section ranges from 35 to 45 percent.

The A horizon has hue of 10YR, value of 1 to 3, and chroma of 1 to 3. Salinity is very slight or slight. Reaction ranges from slightly acid to slightly alkaline.

The Bg horizons have hue of 10YR to 5Y, value of 4 or 5, and chroma of 1 to 3. Texture is clay loam or clay. Iron concentrations are common in shades of brown. Calcium carbonate concretions range from few to common and are concentrated in the lower part near the contact with the 2B horizon in most pedons. Salinity is very slight or slight. Effervescence ranges from none to slight. Reaction ranges from neutral to moderately alkaline.

The 2Bg horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 1 to 6. The texture is fine sand or loamy fine sand. Iron concentrations range from none to common in shades of brown. Some pedons have gravelly strata made of mainly shell fragments. Salinity ranges from slight to moderate. Effervescence ranges from none to slight. Reaction ranges from neutral to moderately alkaline. The 2Bg2 horizon is absent in some pedons.

The 2C horizon, where present, has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 2 or 3. Some pedons are mottled in shades of gray and brown. Texture is fine sand or loamy fine sand. Some pedons have gravelly strata consisting of shell fragments. Salinity is slight or moderate. Effervescence ranges from none to slight. Reaction ranges from neutral to moderately alkaline.

Bancker Series

The Bancker series consists of very deep, very poorly drained, very slowly permeable saline soils that formed in unconsolidated clayey sediments that are permanently saturated with water. These soils are in broad marshes. Slopes are 0 to 1 percent, but typically less than 0.5 percent. The soils of the Bancker series are very-fine, smectitic, nonacid, hyperthermic Sodic Hydraquents.

Typical pedon of Bancker mucky peat, 0 to 1 percent slopes, frequently flooded, tidal; Jefferson County, Texas; from the intersection of Texas Highways 73 and 87 and the Neches River in Port Arthur, 3.6 miles northwest by boat on the Neches River to Bird Island Bayou, 0.3 mile northwest on Bird Island Bayou to manmade waterway, 1.35 miles northwest on manmade waterway and 200 feet southeast of waterway in Bessie Heights Marsh. (lat. 30 degrees 00 minutes 34 seconds N. and long. 93 degrees 54 minutes 46 seconds W.)

Oa—0 to 8 inches; very dark gray (2.5Y 3/1) mucky peat; about 15 percent rubbed; massive; many fine and medium roots; very fluid, flows easily between fingers leaving mainly roots in hand; moderately acid; clear smooth boundary.

Cg1—8 to 17 inches; black (N 2.5/) clay; massive; many strata of black (2.5Y 2.5/1) and gray (N 5/) mostly decomposed organic matter; n value is more than 1.0; slightly alkaline; gradual smooth boundary.

Cg2—17 to 30 inches; greenish gray (5BG 5/1) clay; massive; common very fine and fine roots; common strata of black (2.5Y 2.5/1) and gray (N 5/) of mostly decomposed organic matter; n value is more than 1.0; 5 percent fine prominent brownish yellow (10YR 6/8) masses of oxidized iron with diffuse boundaries; slightly alkaline; gradual smooth boundary.

Cg3—30 to 50 inches; greenish gray (5BG 6/1), clay; massive; common very fine and fine roots; many strata of black (2.5Y 2.5/1) and gray (N 5/) of mostly decomposed organic matter; n value is more than 1.0; very few thin lenses of very fine sand, less than 1 centimeter thick; 5 percent fine prominent light olive brown (2.5Y 5/6) masses of oxidized iron with diffuse boundaries; slightly alkaline; gradual smooth boundary.

Cg4—50 to 72 inches; gray (2.5Y 5/1) clay; massive; common very fine and fine roots; few strata of black (2.5Y 2.5/1) and gray (N 5/) mostly decomposed organic matter; n value is more than 1.0; very few thin lenses of very fine sand, less than 1 centimeters thick; 5 percent fine prominent light olive brown (2.5Y 5/6) masses of oxidized iron with diffuse boundaries; slightly alkaline; gradual smooth boundary.

Cg5—72 to 80 inches; very dark gray (10YR 3/1) clay; massive; common very fine and fine roots; n value is more than 1.0; very few lenses of very fine sand, less than 1 centimeters thick; slightly acid.

These soils are continuously saturated with brackish water. Soil salinity is moderately to strongly saline in the upper part and ranges to strongly saline in the lower part. The electrical conductivity of the saturation extract is more than 8 in the upper part and more than 16 in the lower part. Sodium adsorption ratio (SAR) ranges from 13 to 30. All of the mineral horizons above a depth of 60 inches have an n value of 1 or more. The reaction ranges from strongly acid to slightly alkaline in the Oa layer and from moderately acid to slightly alkaline in the Ag and Cg horizons.

The Oa horizon has hue of 7.5YR or 10YR, value of 2 to 4, and chroma of 1 or 2.

The Ag horizon, where present, has hue of 10YR to 5Y, or N, value of 2 to 4, and chroma of 2 or less. Texture is clay, silty clay, or mucky clay.

The Cg horizons have hue of 10YR to 5Y, 5GY, or 5BG, value of 4 to 6, and chroma of 1, or is neutral. Texture is clay, silty clay, or mucky clay. Iron concentrations are in shades of brown or olive.

Barbary Series

The Barbary series consists of very deep, very poorly drained, very slowly permeable soils that formed in unconsolidated clayey bottomland sediments that are permanently saturated with water. The soils are in broad swamps. Slopes are 0 to 1 percent, but typically less than 1 percent. The soils of the Barbary series are very-fine, smectitic, nonacid, hyperthermic Typic Hydraquents.

Typical pedon of Barbary mucky clay, 0 to 1 percent slopes, frequently flooded; Orange County, Texas: from the intersection of Texas Highway 105 and Farm Road 1131, about 4.6 miles north of Vidor, 2.75 miles west on Farm Road 1131, 3.7 miles south along ditch on private road and 100 feet east of road. (lat. 30 degrees 08 minutes 22 seconds N. and long. 94 degrees 03 minutes 50 seconds W.)

A—0 to 5 inches; gray (10YR 5/1) mucky clay; massive; fluid, flows easily between fingers when squeezed leaving small residue; common fine to coarse roots; very strongly acid; clear smooth boundary.

Cg1—5 to 16 inches; gray (2.5Y 5/1) clay; massive; fluid, flows with difficulty between fingers when squeezed leaving small residue; few fine to coarse roots; strongly acid; gradual smooth boundary.

Cg2—16 to 32 inches; gray (2.5Y 6/1) clay; massive; very fluid, flows easily between fingers when squeezed leaving small residue; strongly acid; clear smooth boundary.

Cg3—32 to 48 inches; gray (2.5Y 6/1) clay; massive; very fluid, flows easily between fingers when squeezed leaving small residue; common fine distinct olive (5Y 5/6) iron concentrations; few thin sandy lenses; moderately acid; gradual smooth boundary.

Cg4—48 to 55 inches; gray (2.5Y 6/1) clay; massive; very fluid, flows easily between fingers when squeezed leaving small residue; common fine distinct olive (5Y 5/6) iron concentrations; moderately acid; gradual smooth boundary.

Cg5—55 to 80 inches; gray (2.5Y 6/1) clay; massive; fluid, flows easily between fingers when squeezed leaving small residue; common fine distinct olive (5Y 5/6) iron concentrations; common wood fragments; moderately acid; gradual smooth boundary.

The n value is more than 0.7 in all horizons to a depth of 40 inches or more. Reaction ranges from strongly acid to slightly alkaline in the Oa horizon, from very strongly acid to slightly alkaline in the A horizon, and from strongly acid to moderately alkaline in the Cg horizon.

The Oa horizon, where present, has hue of 5YR to 10YR, value of 2 to 4, and chroma of 1 to 3. It is muck or peat.

The A horizon has hue of 10YR to 5Y, value of 3 to 5, and chroma of 1 to 3. It is a fluid or very fluid clay or mucky clay.

The Cg horizon has hue of 10YR to 5Y, 5GY, 5G, or 5BG, value of 4 to 6, and chroma of 1 or it is neutral with value of 4 to 6. Texture is fluid or very fluid clay or mucky clay. Thin layers of peat or muck and layers of wood, logs, and stumps are present in some pedons.

Barnett Series

The Barnett series consists of very deep, very poorly drained, very slowly permeable saline soils that formed in unconsolidated clayey sediments. These soils are in broad marshes. Slopes are 0 to 1 percent, but typically less than 1 percent. The soils of the Barnett series are fine, smectitic, nonacid, hyperthermic Vertic Fluvaquents.

Typical pedon of Barnett mucky peat, 0 to 1 percent slopes, frequently flooded, tidal; Jefferson County, Texas; from intersection of Farm Road 3322 and Texas Highway 87 in Sabine Pass, 13.75 miles southwest on Texas Highway 87, 0.8 mile north on private road and 30 feet west in rangeland. (lat. 29 degrees 40 minutes 10 seconds N. and long. 94 degrees 06 minutes 15 seconds W.)

Oe—0 to 2 inches; very dark gray (10YR 3/1) mucky peat; massive; about 75 percent fiber, 20 percent rubbed; very fluid, flows easily between fingers leaving mainly roots in hand (n value of 1.0); many fine to coarse roots; slightly saline; very strongly acid; abrupt smooth boundary.

A—2 to 6 inches; dark gray (10YR 4/1) clay; strong fine subangular blocky structure; hard, firm, very sticky, very plastic; many fine roots; moderately saline; slightly acid; clear smooth boundary.

Bg1—6 to 12 inches; gray (N 5/) clay, gray (10YR 5/1) upon exposure to air; strong fine subangular blocky structure; hard, firm, very sticky, very plastic; many fine roots; common fine and medium prominent brown (10YR 4/3) iron concentrations with diffuse boundaries on faces of peds; few fine salt crystals; moderately saline; slightly acid; clear smooth boundary.

Bg2—12 to 22 inches; gray (N 5/) clay, gray (10YR 5/1) upon exposure to air; strong fine subangular blocky structure; hard, firm, very sticky, very plastic; common fine and medium prominent dark yellowish brown (10YR 4/4) iron concentrations with diffuse boundaries in ped interiors; few fine faint gray (N 6/) iron depletions on faces of peds; strongly saline; slightly acid; clear smooth boundary.

Cg1—22 to 42 inches; gray (N 5/) mucky clay, gray (2.5Y 5/1) upon exposure to air; common vertical seams of gray (N 6/); slightly fluid, flows with difficulty between fingers leaving residue in hand (n value of more than 0.7); few fine roots; common fine and medium faint dark gray (N 4/) iron depletions; common fine prominent dark yellowish brown (10YR 4/4) iron-manganese concentrations with diffuse boundaries in clusters; strongly saline; slightly acid; gradual smooth boundary.

Cg2—42 to 65 inches; coarsely stratified very dark gray (10YR 3/1), dark gray (10YR 4/1), gray (10YR 6/1), and grayish brown (10YR 5/2) mucky clay, very dark grayish brown (10YR 3/2), dark grayish brown (10YR 4/2), and light brownish gray (10YR 6/2) upon exposure to air; moderately fluid, flows between fingers leaving residue in hand (n value of more than 1.0); common fine distinct light gray (10YR 7/1) iron depletions and yellowish brown (10YR 5/4) iron concentrations with diffuse boundaries; strongly saline; neutral; gradual smooth boundary.

Cg3—65 to 80 inches; dark gray (10YR 4/1) and very dark gray (10YR 3/1) mucky clay, dark grayish brown (10YR 4/2) and very dark grayish brown (10YR 3/2) upon exposure to air; moderately fluid, flows between fingers leaving residue in hand (n value of more than 1.0); common fine prominent light gray (10YR 7/1) iron depletions; strongly saline; neutral.

The thickness of the solum and depth to layers more than 4 inches thick with n value of more than 0.7 is 20 to 40 inches. These soils have aquic soil conditions throughout in most years.

The O horizon has neutral colors with value of 3 or 4 or has colors with hue of 10YR, value of 3 or 4, and chroma of 1. The n value is more than 0.7. The electrical conductivity ranges from 2 to 8 dS/m. The reaction ranges from very strongly acid to slightly acid.

The A horizon has neutral colors with value of 4 or 5 or has colors with hue of 10YR, value of 4 or 5, and chroma of 1. The n value is less than 0.7. Texture is clay loam or clay. Electrical conductivity ranges from 2 to 16 dS/m. Reaction ranges from strongly acid to slightly acid.

The Bg horizon has neutral colors with value of 5 or 6 or has colors with hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1. Iron concentrations in shades of brown or gray are few to common. The n value is less than 0.7. Electrical conductivity ranges from 4 to 16 dS/m. Reaction is moderately acid or slightly acid.

The Cg horizon has neutral colors with value of 3 to 7 or has colors with hue of 10YR or 2.5Y, value of 3 to 7, and chroma of 1. Few to common iron concentrations in shades of brown range from few to common. Iron depletions in shades of gray range from few to common. The n value ranges from 0.7 to 1.0 in the upper part and ranges to 1.5 in the lower part in some pedons. Electrical conductivity ranges from 8 to 16 dS/m. Reaction ranges from moderately acid to neutral.

Beaumont Series

The Beaumont series consists of very deep, poorly drained, very slowly permeable soils that formed in clayey sediments. These soils are on broad prairies. Slopes are 0 to 1 percent. The soils of the Beaumont series are fine, smectitic, hyperthermic Chromic Dystraquerts.

Typical pedon of Beaumont clay, 0 to 1 percent slopes (fig. 30); Jefferson County, Texas; from the intersection of Interstate Highway 10 and U.S. Highway 90 in Beaumont, 12.2 miles west on U.S. Highway 90, 4.6 miles south on South China Road, 1.0 mile east on county road, 0.5 mile south on field road and 150 feet west in

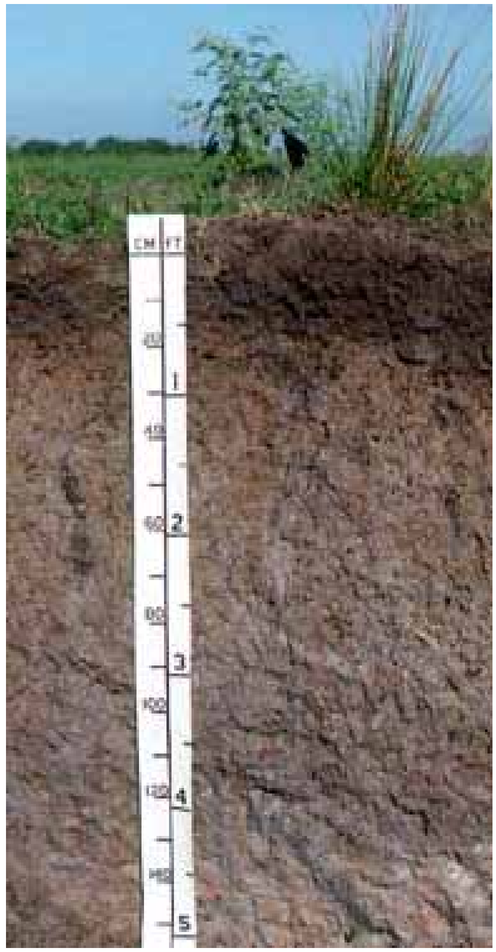

Figure 30.—Profile of Beaumont clay, 0 to 1 percent slopes. A relatively thin dark colored surface layer about 6 inches thick lies on top of the gray clayey subsoil.

cropland. (lat. 29 degrees 58 minutes 39 seconds N. and long. 94 degrees 19 minutes 50 seconds W.)

Ap—0 to 5 inches; dark gray (10YR 4/1) clay; weak fine granular structure; extremely hard, extremely firm; common fine and medium roots; few fine pores; common fine prominent yellowish red (5YR 4/6) and common medium prominent strong brown (7.5YR 5/6) iron concentrations; very strongly acid; abrupt smooth boundary.

A—5 to 9 inches; dark gray (10YR 4/1) clay; moderate fine angular blocky structure; extremely hard, extremely firm; common fine and medium roots; few fine pores; common coarse prominent yellowish red (5YR 4/6) iron concentrations; dark yellowish brown (10YR 4/6) iron concentrations in pores and along root channels; few fine iron-manganese concretions; very strongly acid; abrupt smooth boundary.

Bg—9 to 19 inches; gray (10YR 5/1) clay; moderate fine angular blocky structure; extremely hard, extremely firm; common fine and medium roots; few fine pores; common distinct pressure faces; common coarse prominent yellowish red (5YR 4/6) and common medium prominent strong brown (7.5YR 5/6) iron concentrations; dark yellowish brown (10YR 4/6) iron concentrations in pores and along root channels; common fine iron-manganese concretions and masses; very strongly acid; gradual wavy boundary.

Bssg1—19 to 43 inches; gray (N 6/) clay; strong fine angular blocky structure; extremely hard, extremely firm; few fine and medium roots; few fine pores; common to many (increase with depth) prominent slickensides tilted 65 to 75 degrees from horizontal that are 4 to 6 inches apart; few medium prominent red (2.5YR 4/6) and common medium prominent reddish yellow (7.5YR 6/6) iron concentrations; dark yellowish brown (10YR 4/6) iron concentrations in pores and along root channels; common fine iron-manganese concretions and masses; very strongly acid; gradual wavy boundary.

Bssg2—43 to 56 inches; gray (N 6/) clay; strong fine angular blocky structure; extremely hard, extremely firm; few fine and medium roots; few fine pores; many prominent slickensides tilted 65 to 75 degrees from horizontal that are 4 to 6 inches apart; common medium prominent red (2.5YR 4/6) and reddish yellow (7.5YR 6/6) iron concentrations; very strongly acid; gradual wavy boundary.

Bssg3—56 to 80 inches; light gray (N 7/) clay; strong fine angular blocky structure; extremely hard, extremely firm; few fine and medium roots; few fine pores; many prominent slickensides tilted 65 to 75 degrees from horizontal that are 4 to 6 inches apart; common medium prominent red (2.5YR 4/6) and reddish yellow (7.5YR 6/6) iron concentrations; very strongly acid; gradual wavy boundary.

The range in characteristics includes 50 percent or more of the pedon. The thickness of the solum is more than 80 inches. Texture is clay or silty clay throughout. Weighted average clay content of the control section is 45 to 60 percent. Undisturbed areas have gilgai microrelief with microhighs 4 to 15 inches above the microlows. When dry, cracks 0.5 to more than 1 inch wide at the surface extend to a depth of 12 inches or more. Cracks remain open for less than 60 cumulative days in most years. Depth to slickensides and wedge-shaped peds begin at a depth ranging from 10 to 24 inches. Iron-manganese concretions or masses range from few to common.

The A horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma 1 or 2. Iron concentrations in shades of red, yellow, and brown range from few to many. Reaction is extremely acid or very strongly acid.

The Bg horizon has hue of 10YR to 5Y, and N, value 5 to 7, and chroma of 2 or less. Iron concentrations in shades or red, yellow, or brown range from few to many. Reaction is extremely acid or very strongly acid.

The Bssg horizon has hue of 10YR to 5Y, and N, value of 5 to 7, and chroma of 2 or less. Iron concentrations in shades of red, yellow, or brown range from few to many. In some pedons, gypsum crystals or calcium carbonate concretions in clusters, make up 1 to 5 percent. Reaction is extremely acid to strongly acid in the upper part, very strongly acid to moderately acid in the middle part, and very strongly acid to neutral in the lower part.

Bevil Series

The Bevil series consists of very deep, poorly drained, very slowly permeable soils that formed in clayey sediments. These soils are on broad forested terraces. Slopes are 0 to 1 percent. The soils of the Bevil series are fine, smectitic, thermic Chromic Dystraquerts.

Typical pedon of Bevil clay, 0 to 1 percent slopes; Jefferson County, Texas; from the intersection of Interstate Highway 10 and U.S. Highway 90 in Beaumont, 12.2 miles west on U.S. Highway 90 to China, 1.5 miles north on North China Road, 1.3 miles west on private road, 1.1 miles north on farm road, 0.25 miles west to Cotton Creek, 0.1 mile south on farm road and 75 feet west in woodland. (lat. 30 degrees 05 minutes 11 seconds N. and long. 94 degrees 21 minutes 40 seconds W.)

Ag—0 to 9 inches; gray (N 5/) clay; weak coarse angular blocky structure; very hard, very firm, very sticky, very plastic; few fine roots; few fine pores; common fine distinct dark yellowish brown (10YR 4/6) iron concentrations; few fine distinct strong brown (7.5YR 5/6) stains along root channels; extremely acid; clear smooth boundary.

Bg—9 to 23 inches; dark gray (10YR 4/1) clay; weak medium prismatic structure parting to strong fine angular blocky; very hard, very firm, very sticky, very plastic; few fine roots; few fine pores; few fine distinct dark yellowish brown (10YR 3/6) and common fine distinct brownish yellow (10YR 6/8) iron concentrations; extremely acid; gradual wavy boundary.

Bssg1—23 to 34 inches; dark gray (N 4/) clay; moderate medium prismatic structure parting to moderate fine angular blocky; very hard, very firm, very sticky, very plastic; few fine roots; few fine pores; common prominent slickensides; few pressure faces; few fine prominent strong brown (7.5YR 5/8) and few fine prominent yellowish brown (10YR 5/8) iron concentrations; few soft brown iron-manganese masses 2 to 3 millimeters in diameter; extremely acid; gradual wavy boundary.

Bssg2—34 to 45 inches; gray (N 5/) clay; moderate medium prismatic structure parting to weak medium subangular blocky; very hard, very firm, very sticky, very plastic; few fine roots; few fine pores; few pressure faces; common prominent slickensides; few fine distinct dark yellowish brown (10YR 4/4) and few fine prominent brownish yellow (10YR 6/8) iron concentrations; very strongly acid; gradual wavy boundary.

Bssg3—45 to 55 inches; gray (N 6/) clay; moderate medium prismatic structure parting to weak medium angular blocky structure; very hard, very firm, very sticky, very plastic; few fine roots; few fine pores; few pressure faces; common prominent slickensides; few fine prominent yellowish brown (10YR 5/8) and common fine and medium distinct light olive brown (2.5Y 5/4) iron concentrations; strongly acid; gradual wavy boundary.

Bssg4—55 to 66 inches; light gray (N 7/) clay; moderate medium prismatic structure parting to moderate fine angular blocky; very hard, very firm, very sticky, very plastic; few fine roots; few fine pores; common pressure faces; common prominent slickensides; few fine prominent yellowish brown (10YR 5/8) and common fine and medium prominent brownish yellow (10YR 6/8) iron concentrations; few soft brown concretions 2 to 3 millimeters in diameter; few gray clayey krotovina; slightly acid; gradual wavy boundary.

Bssg5—66 to 80 inches; light gray (N 7/) clay; moderate medium prismatic structure parting to moderate fine angular blocky; very hard, very firm, very sticky, very plastic; few very fine roots; few fine pores; many pressure faces; common prominent slickensides; many coarse prominent brownish yellow (10YR 6/8) iron concentrations; few soft brown masses 2 to 3 millimeters in diameter; common soft black masses 3 to 10 millimeters in diameter; neutral.

The range in characteristics includes 50 percent or more of the pedon unless otherwise stated. The thickness of the solum is more than 80 inches. Texture is clay or silty clay throughout. Weighted average clay content of the particle-size control section is 45 to 60 percent. This cyclic soil ranges from about 3 to 12 feet from the top of the microhigh to the center of the microlow. Undisturbed areas have gilgai microrelief with microhighs 4 to 15 inches above the microlows. The microhighs comprise about 30 percent, the microlows about 50 percent, and the intermediate areas about 20 percent. When dry, cracks 0.5 to 1 inch wide occur at the surface, which extend to a depth of 12 inches or more. Cracks remain open for less than 60 cumulative days in most years. Slickensides and wedge-shaped peds begin at a depth of 12 to 25 inches. Iron-manganese concretions and masses range from few to common. These soils have aquic soil conditions within 1 foot of the surface in most years.

The A horizon has neutral colors with value of 4 or 5 or has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 or 2. Iron concentrations in shades of red, yellow, and brown range from few to many. The A horizon ranges from 3 to 15 inches thick from the microhigh to microlow but is commonly 6 to 12 inches thick. Reaction is extremely acid or very strongly acid.

The Bg horizon has neutral colors with value 5 to 7 or has hue of 10YR to 5Y, value 4 to 7, and chroma of 1 or 2. Iron concentrations in shades of red, yellow, or brown range from few to many. Reaction is extremely acid or very strongly acid.

The Bssg horizons have neutral color with value 4 to 7 or have hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. Iron concentrations in shades of red, yellow, or brown range from few to many. Reaction is extremely acid to strongly acid in the upper part, very strongly acid to moderately acid in the middle part, and very strongly acid to neutral in the lower part.

Bienville Series

The Bienville series consists of very deep, somewhat excessively drained, moderately rapidly permeable soils that formed in sandy sediments. These soils are on forested terrace ridges. Slope ranges from 0 to 3 percent. The soils of the Bienville series are siliceous, thermic Psammentic Paleudalfs.

Typical pedon of Bienville loamy fine sand in an area of Bienville-Camptown complex, 0 to 1 percent slopes, Orange County, Texas; from the intersection of Texas Highway 105 and Farm Road 1131, about 4.6 miles north of Vidor, 2.75 miles west on Farm Road 1131, 1.0 mile south along ditch on private road, 0.9 mile south on private road and 25 feet west of road. (lat. 30 degrees 11 minutes 25 seconds N. and Latitude 94 degrees 04 minutes 15 seconds W.)

A1—0 to 8 inches; dark grayish brown (10YR 4/2) loamy fine sand; weak medium granular structure; soft, loose; many tree roots of all sizes; strongly acid; gradual smooth boundary.

A2—8 to 12 inches; brown (10YR 4/3) loamy fine sand and common medium distinct masses of pale brown (10YR 6/3) uncoated sand; single grain; soft, loose; many fine roots; strongly acid; gradual smooth boundary.

E—12 to 23 inches; light brown (7.5YR 6/4) and strong brown (7.5YR 5/6) loamy fine sand; single grain; soft, loose; common fine roots; strongly acid; gradual wavy boundary.

E/Bt—23 to 31 inches; light yellowish brown (10YR 6/4) (E) loamy fine sand and 30 percent masses of yellowish red (5YR 5/6) loamy fine sand (Bt); single grain; soft, loose; common fine roots; common faint clay bridging; very strongly acid; gradual wavy boundary.

Bt/E—31 to 53 inches; strong brown (7.5YR 5/6) (Bt) and very pale brown (10YR 7/4) loamy fine sand (E); 20 percent yellowish red (5YR 5/6) masses of finer material; single grain; soft, loose; common fine roots; common faint clay bridging; very strongly acid; gradual wavy boundary.

E'/Bt—53 to 80 inches; very pale brown (10YR 7/3) (E) and light brownish gray (10YR 6/2) (Bt) loamy fine sand; many coarse prominent strong brown (7.5YR 5/8) masses and lamellae of finer material; soft, loose; common fine roots; very strongly acid.

The thickness of the solum ranges from 60 to 80 inches. Total fines (clay, silt, and very fine sand) range from 30 to 50 percent.

The A or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. Reaction ranges from very strongly acid to slightly acid.

The E horizon and the E part of the Bt/E or E/Bt horizon have hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 3 or 4. The Bt part has hue of 10YR to 5YR, value of 4 to 6, and chroma of 2 to 6. Texture is fine sand or loamy fine sand. Reaction ranges from very strongly acid to slightly acid.

Bleakwood Series

The Bleakwood series consists of very deep, poorly drained, moderately permeable soils that formed in loamy and clayey alluvial sediments. These soils are on forested flood plains. Slopes are 0 to 1 percent, but typically less than 1 percent. The soils of the Bleakwood series are fine-loamy, siliceous, active, acid, thermic Typic Endoaquepts.

Typical pedon of Bleakwood loam, 0 to 1 percent slopes, frequently flooded; Orange County, Texas; from the intersection of Interstate Highway 10 and Farm Road 1131, about 4 miles east of Vidor, 1.7 miles east on access road of Interstate Highway 10, north 0.05 mile under bridge by Cow Bayou, west 0.3 mile along access road to Interstate Highway 10, 0.3 mile north and west on park road and 700 feet north of road. (lat. 30 degrees 08 minutes 15 seconds N. and Latitude 93 degrees 55 minutes 22 seconds W.)

A—0 to 6 inches; brown (10YR 4/3) loam, weak fine granular structure; slightly hard, friable, slightly sticky, nonplastic; many fine roots; moderately acid; clear smooth boundary.

Bg1—6 to 15 inches; light gray (10YR 7/2) loam, weak fine subangular blocky structure; slightly hard, friable, slightly sticky, nonplastic; common fine roots; few fine distinct brownish yellow (10YR 6/6) and common medium distinct dark yellowish brown (10YR 4/6) iron concentrations; very strongly acid; gradual wavy boundary.

Bg2—15 to 27 inches; light brownish gray (10YR 6/2) loam, weak fine subangular blocky structure; slightly hard, friable, slightly sticky, nonplastic; common fine roots; few fine faint light gray iron depletions; very strongly acid; gradual wavy boundary.

Bg3—27 to 42 inches; light brownish gray (10YR 6/2) silt loam; weak medium subangular blocky structure; slightly hard, friable, slightly sticky, nonplastic; common fine roots; common medium distinct yellowish brown (10YR 5/6) iron concentrations, and common yellowish brown (10YR 5/8) root stains; very strongly acid; gradual smooth boundary.

Bg4—42 to 80 inches; light brownish gray (10YR 6/2) silty clay loam; weak medium subangular blocky structure; slightly hard, friable, slightly sticky, nonplastic; common fine roots; common medium distinct yellowish brown (10YR 5/6) iron concentrations, and common yellowish brown (10YR 5/8) root stains; very strongly acid; gradual smooth boundary.

The thickness of the solum is more than 80 inches. The weighted average clay content of the 10- to 40-inch control section ranges from 18 to 35 percent clay and contains more than 15 percent sand that is coarser than very fine sand. Reaction is strongly acid or very strongly acid except in the surface layer, which is moderately acid. Organic carbon content ranges from 0.2 to 0.4 percent at a depth of 50 inches below the mineral soil surface.

The A horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4. The texture is loam, silt loam, or fine sandy loam.

The Bg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Texture is fine sandy loam, silty clay loam, silt loam, loam, or clay loam. Iron concentrations range from few to many in shades of yellow and brown.

Camptown Series

The Camptown series consists of very deep, very poorly drained and ponded, very slowly permeable soils that formed in loamy and clayey sediments. These soils are in depressions in swamps. Slopes are 0 to 1 percent, but typically less than 1 percent. The soils of the Camptown series are fine-silty, siliceous, active, thermic Typic Glossaqualfs.

Typical pedon of Camptown silt loam, 0 to 1 percent slopes, ponded; Orange County, Texas; from intersection of Farm Road 105 and Farm Road 1135, north of Vidor, 5.6 miles northwest on Farm Road 1135 to forest road, 300 yards east on forest road and 100 feet north in swamp. (lat. 30 degrees 13 minutes 19 seconds N. and long. 94 degrees 05 minutes 17 seconds W.)

A—0 to 5 inches; dark gray (10YR 4/1) silt loam; moderate fine subangular blocky structure; slightly hard, friable; many fine and medium roots; few strong brown (7.5YR 4/6) iron concentrations along root channels; many fine and medium distinct light brownish gray (10YR 6/2) iron depletions; very strongly acid; clear wavy boundary.

Eg—5 to 8 inches; gray (10YR 5/1) silt loam; weak subangular blocky structure; slightly hard, friable; many fine and medium roots; common fine vesicular and tubular pores; few yellowish brown (10YR 5/4) iron concentrations along root channels; very strongly acid; gradual irregular boundary.

E/Btg—8 to 14 inches; gray (10YR 6/1) silt loam (E); weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable; common fine and few medium roots; common fine vesicular and tubular pores; common medium prominent yellowish red (5YR 5/6) iron concentrations in E material; common yellowish red (5YR 5/6) iron concentrations along root channels; 40 percent gray (10YR 5/1) silty clay loam (Bt); about 10 percent of the matrix is brittle: very strongly acid; gradual wavy boundary.

Btg/E1—14 to 35 inches; gray (10YR 5/1) silty clay loam (Bt); weak medium prismatic structure parting to moderate medium subangular blocky; hard, friable; common fine and few medium roots; common fine vesicular and tubular pores; many medium prominent yellowish brown (10YR 5/6) iron concentrations; common reddish brown (5YR 4/4) iron concentrations along root channels; 20 percent gray (10YR 6/1) streaks 1 to 3 inches wide of albic material (E); very strongly acid; gradual wavy boundary.

Btg/E2—35 to 40 inches; dark gray (10YR 4/1) silty clay loam (Bt); weak medium prismatic structure parting to moderate medium subangular blocky structure; hard, friable; common fine vesicular and tubular pores; many medium prominent reddish brown (5YR 4/4) iron concentrations; about 20 percent streaks, 1 to 3 inches wide, of gray (10YR 5/1) silt loam albic material (E); very strongly acid; gradual wavy boundary.

Btg1—40 to 58 inches; dark gray (10YR 4/1) silty clay; moderate medium angular blocky structure; hard, firm; few fine roots; few dark gray (10YR 4/1) clay films; common medium prominent reddish brown (5YR 4/4) and yellowish red (5YR 5/6) iron concentrations; very strongly acid; gradual wavy boundary.

Btg2—58 to 72 inches; dark gray (10YR 4/1) silty clay; moderate medium angular blocky structure; hard, firm; few fine roots; few iron-manganese stains along roots; 40 percent reddish brown (5YR 4/4) and yellowish red (5YR 5/6) iron concentrations; few gypsum crystals; very strongly acid; gradual wavy boundary.

Bt—72 to 80 inches; 60 percent brown (10YR 5/3) and 40 percent yellowish red (5YR 5/6) silty clay; moderate medium angular blocky structure; hard, firm; few gypsum crystals; few fine masses of barite; very strongly acid.

The thickness of the solum is more than 80 inches. Clay content of the particle-size control section ranges from 20 to 35 percent with the silt content exceeding 40 percent. Depth to the clayey Btg horizon ranges from 30 to 50 inches. The SAR at the Btg/E and Btg contact ranges from 4 to 12. These soils have aquic conditions in most years.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 to 3. Texture is silt loam. Reaction ranges from extremely acid to strongly acid.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Texture is loam or silt loam. Iron concentrations are in shades of red, yellow, or brown. Reaction ranges from extremely acid to strongly acid.

The glossic horizon, or E/Bt and Btg/E horizons, have hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. Texture of the Bt part is silty clay loam or clay loam. The E part, or albic material, has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Iron concentrations in shades of red, yellow, or brown have hue of 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8. Brittleness ranges from 5 to 25 percent of the glossic horizon. Reaction ranges from extremely acid to strongly acid.

The Btg horizon has hue 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. Texture is silty clay or clay. Iron concentrations, in shades of red, yellow, or brown, have hue 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8. Gypsum crystals and masses of barite salt range from few to common. Reaction ranges from extremely acid to strongly acid.

The Bt horizon, present in most pedons, has hue of 2.5YR to 2.5Y, value of 4 to 6, and chroma of 1 to 6. Texture is silty clay loam or clay loam. Iron concentrations, where present, are in shades of red, yellow, or brown. Gypsum crystals and barite salts range from few to common. Reaction ranges from very strongly acid to moderately acid.

Caplen Series

The Caplen series consist of very deep, very poorly drained, very slowly permeable soils that formed in unconsolidated clayey sediments that are permanently saturated with water. They are in broad marshes. Slopes are 0 to 1 percent, but typically less than 0.5 percent. The soils of the Caplen series are fine, smectitic, nonacid, hyperthermic Typic Hydraquents.

Typical pedon of Caplen mucky peat, 0 to 1 percent slopes, frequently flooded, tidal; Jefferson County, Texas; from the crossing of Texas Highway 73 with Taylor Bayou about 1 mile west of Port Arthur, 1.0 mile east by boat on Taylor Bayou to Big Hill Bayou, about 6.0 miles south and west on Big Hill Bayou to Blind Bayou, 0.5 miles west on Big Hill Bayou to south shoreline and 50 feet south in marsh. (lat. 29 degrees 49 minutes 13 seconds N. and long. 94 degrees 02 minutes 57 seconds W.)

Oe—0 to 5 inches; very dark gray (N 3/) mucky peat; massive; very fluid, flows easily between fingers and leaves small residue in hand when squeezed (n value of more than 1.0); slightly sticky, nonplastic; estimated 25 percent fibric material and 20 percent hemic and sapric material; many fine and medium roots; very slightly saline; slightly acid; clear smooth boundary.

Oa—5 to 12 inches; very dark gray (N 3/) mucky peat; massive; very fluid, flows easily between fingers and leaves small residue in hand when squeezed (n value of more than 1.0); slightly sticky, nonplastic; estimated 10 percent fibric material and 35 percent hemic and sapric material; few fine roots; very slightly saline; slightly acid; clear smooth boundary.

Ag1—12 to 24 inches; very dark gray (N 3/) mucky clay; massive; very fluid, flows easily between fingers and leaves small residue in hand when squeezed (n value of more than 1.0); very sticky, very plastic; slightly saline; slightly acid; gradual smooth boundary.

Ag2—24 to 37 inches; very dark gray (N 3/) clay; massive; very fluid, flows easily between fingers and leaves small residue in hand when squeezed (n value of more than 1.0); common fine distinct dark grayish brown (2.5Y 4/2) depletions; very sticky, very plastic; slightly saline; neutral; gradual smooth boundary.

Cg1—37 to 58 inches; dark gray (N 4/) clay; massive; very fluid, flows easily between fingers and leaves small residue in hand when squeezed (n value of more than 1.0); very sticky, very plastic; slightly saline; neutral; gradual smooth boundary.

Cg2—58 to 70 inches; stratified light gray (2.5Y 6/1) and dark gray (N 4/) clay; massive; very fluid, flows easily between fingers and leaves small residue in hand when squeezed (n value of more than 1.0); common fine distinct black (N 2.5/) depletions; very sticky, very plastic; slightly saline; neutral; gradual smooth boundary.

Cg3—70 to 80 inches; stratified light gray (2.5Y 6/1) and dark gray (N 4/) clay; massive; very fluid, flows easily between fingers and leaves small residue in hand when squeezed (n value of more than 1.0); common fine prominent yellowish brown (10YR 5/6) iron concentrations; very sticky, very plastic; slightly saline; slightly acid.

These soils have a peraquic moisture regime. The n value is more than 1.0 in all layers to a depth of 40 inches or more. Most pedons have an organic surface layer that ranges from 2 to 14 inches thick. Reaction ranges from slightly acid to slightly alkaline throughout. Electrical conductivity ranges from 2 to 4 dS/m in the upper part and from 4 to 8 dS/m in the 10- to 40-inch control section. The weighted average clay content of the particle-size control section ranges from 45 to 60 percent.

The O horizons, present in most pedons, have hue of 10YR, or N, value of 2 or 3, and chroma of 1 or less. They are mucky peat or muck.

The Ag horizons have hue of 10YR or 2.5Y, or N, value of 2 or 3, and chroma of 1 or less. The texture is clay or silty clay, or their mucky counterpart. Hemic and sapric materials range up to 50 percent of the horizon in some pedons. A few pedons have depletions in shades of gray or greenish gray.

The Cg horizons have hue of 10YR or 2.5Y, or N, value of 4 to 7, and chroma of 1 or less. Texture is clay, silty clay, or silty clay loam. In some pedons below 40 inches, strata of loam or sandy loam occur. Also in some pedons, the lower horizons are stratified with organic materials. Redox depletions and concentrations, in shades of gray and brown, range from few to many.

China Series

The China series consists of very deep, somewhat poorly drained, very slowly permeable soils on low uplands that formed in clayey sediments. Theses soils are on broad prairies. Slopes are 0 to 1 percent. The soils of the China series are fine, smectitic, hyperthermic Oxyaquic Dystruderts.

Typical pedon of China clay, 0 to 1 percent slopes (fig. 31); Jefferson County, Texas; from the intersection of Interstate Highway 10 and U.S. Highway 90 in Beaumont, 12.2 miles west on U.S. Highway 90, 3.8 miles south on South China Road, 400 feet east on field road that crosses a canal and 75 feet south in cropland. (lat. 29 degrees 59 minutes 34 seconds N. and long. 94 degrees 20 minutes 07 seconds W.)

Ap—0 to 4 inches; very dark gray (10YR 3/1) clay, dark gray (10YR 4/1) dry; moderate fine angular blocky structure; extremely hard, extremely firm; many fine and medium roots; few fine pores; about 5 percent dark gray crayfish krotovina; very strongly acid; clear smooth boundary.

A1—4 to 9 inches; very dark gray (10YR 3/1) clay, dark gray (10YR 4/1) dry; moderate coarse platy structure parting to moderate medium angular blocky; extremely hard, extremely firm; common fine and medium roots; few fine pores;

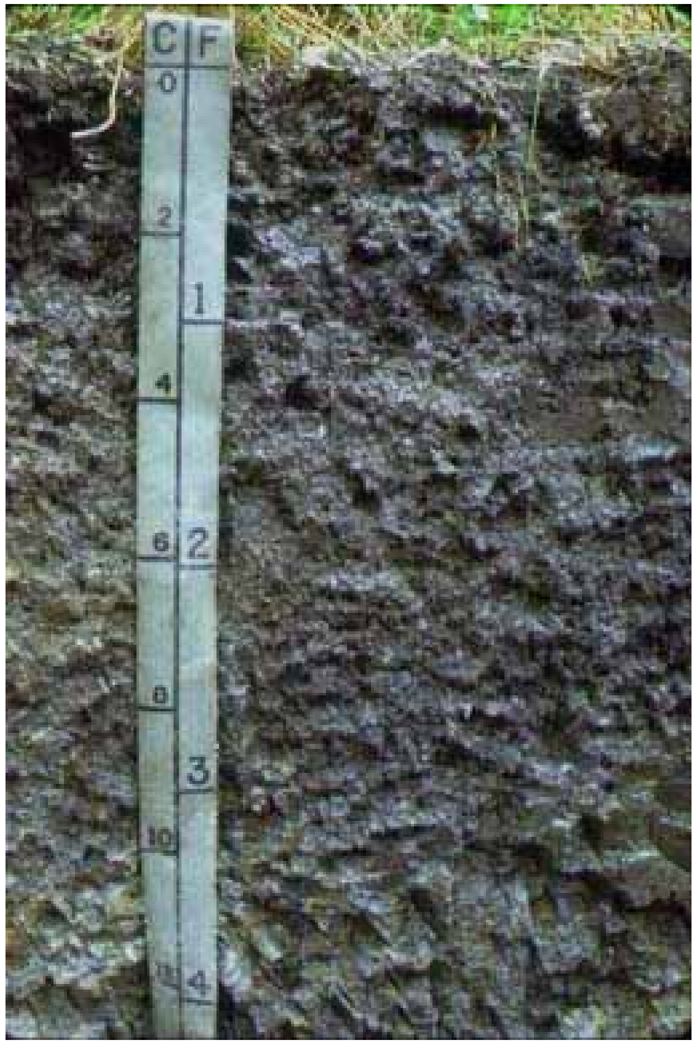

Figure 31.—Profile of China clay, 0 to 1 percent slopes. The dark colored clayey surface layer extends to the dark gray subsoil. Redoximorphic features occur at about 36 inches.

common fine prominent yellowish red (5YR 4/6) iron concentrations; about 5 percent dark gray crayfish krotovina; very strongly acid; clear smooth boundary.

A2—9 to 20 inches; very dark gray (10YR 3/1) clay, dark gray (10YR 4/1) dry; medium fine angular blocky structure; extremely hard, extremely firm; few fine and medium roots; few fine pores; few distinct pressure faces; common fine prominent yellowish red (5YR 4/6) iron concentrations; about 5 percent dark gray crayfish krotovina; very strongly acid; gradual wavy boundary.

Bss1—20 to 28 inches; very dark gray (10YR 3/1) clay, dark gray (10YR 4/1) dry; medium fine angular blocky structure; extremely hard, extremely firm; few fine roots; few fine pores; common prominent pressure faces; few fine prominent yellowish brown (10YR 5/8) iron concentrations; few distinct slickensides; about 5 percent dark gray crayfish krotovina; very strongly acid; gradual wavy boundary.

Bss2—28 to 37 inches; dark gray (10YR 4/1) clay, gray (10YR 5/1) dry; moderate fine angular blocky structure; extremely hard, extremely firm; few fine roots; few fine pores; many prominent pressure faces; common prominent slickensides; common fine prominent yellowish brown (10YR 5/8) iron concentrations along root channels and pores; about 5 percent dark gray crayfish krotovina; very strongly acid; clear wavy boundary.

Bss3—37 to 42 inches; dark gray (10YR 4/1) clay, gray (10YR 5/1) dry; moderate fine angular blocky structure; extremely hard, extremely firm; few fine roots; few fine pores; many prominent pressure faces; common prominent slickensides; common fine prominent yellowish brown (10YR 5/8) and few fine prominent yellowish red (5YR 4/6) iron concentrations; about 5 percent dark gray crayfish krotovina; very strongly acid; clear wavy boundary.

Bssy—42 to 55 inches; dark gray (10YR 4/1) clay; moderate coarse prismatic structure parting to strong fine angular blocky; extremely hard, extremely firm; few fine roots; few fine pores; many prominent pressure faces; common prominent slickensides; common fine prominent yellowish brown (10YR 5/8) and few fine prominent yellowish red (5YR 4/6) iron concentrations; 5 percent fine and 20 percent medium gypsum crystals in clusters; about 5 percent dark gray crayfish krotovina; very strongly acid; clear wavy boundary.

Bssyg—55 to 60 inches; gray (10YR 5/1) clay; moderate coarse prismatic structure parting to strong fine angular blocky; extremely hard, extremely firm; few fine roots; few fine pores; many prominent pressure faces; common prominent slickensides; common fine and medium prominent yellowish brown (10YR 5/8) and common fine prominent dark red (2.5YR 3/6) iron concentrations; 20 percent fine crystals of gypsum dispersed in horizon and 10 percent medium gypsum crystals in clusters and seams; about 5 percent dark gray crayfish krotovina; strongly acid; clear wavy boundary.

Bssg—60 to 80 inches; gray (10YR 6/1) clay; moderate coarse prismatic structure parting to strong fine angular blocky; extremely hard, extremely firm; few fine roots; few fine pores; many prominent pressure faces; common prominent slickensides; common fine and medium prominent dark red (2.5YR 3/6) and common fine and medium prominent yellow (2.5Y 7/6) iron concentrations; about 5 percent dark gray crayfish krotovina; strongly acid.

The range in characteristics includes 50 percent or more of the pedon. The thickness of the solum is more than 80 inches. Thickness of mollic colors range from 12 to 40 inches. The texture is clay throughout. Weighted average clay content of the control section ranges from 45 to 60 percent. When dry, cracks 0.5 to about 1 inch wide extend from the surface to a depth of 12 inches or more. Cracks remain open for less than 60 cumulative days during most years. Slickensides and wedge-shaped peds begin at a depth ranging from 10 to 24 inches. Undisturbed areas have gilgai microrelief with microhighs 6 to 15 inches higher than microlows. Distance from center of the microhigh to center of microlow ranges from 3 to 12 feet. Gypsum crystals make up 5 to 25 percent of the gypsic horizon. Depth to a gypsic horizon is about 40 inches, but ranges from 25 to 50 inches. The gypsic horizon is best expressed and thickest in the microhigh and is thinner and deeper in the microlow.

Microhighs make up 5 to 25 percent of the pedon. Typically, colors in the microhigh have value of 4 or more. Calcium carbonate concretions, mainly in clusters, range from 1 to 5 percent in the lower part of the microhigh in some pedons.

The A horizon has hue of 10YR to 5Y, value of 3, and chroma of 1. In rice culture, Ap horizons, 4 to 6 inches thick, include value that ranges to 4. Iron features range from none to few in shades of brown or gray and are developed by rice culture. Gypsum crystals range from none to few. Reaction ranges from extremely acid to very strongly acid.

The Bss horizon has hue of 10YR to 5Y, value of 3 to 4, and chroma of 1 or less. Iron features range from few to common in shades of brown, yellow, or gray. Iron features in the upper part are developed or enhanced by rice culture. Gypsum crystals range from none to few. Reaction ranges from extremely acid to moderately acid.

The Bssy, Bssyg, and Bssg horizons have hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or less. Iron concentrations range from few to common in shades of yellow or brown. Gypsum crystals are fine, medium, or coarse.The fine crystals are mainly in clusters and seams. The medium and coarse crystals are up to 0.5 inch across and are disseminated throughout the matrix. In some pedons they are concentrated in clusters. Reaction ranges from very strongly acid to slightly acid.

The Bssg horizon has hue of 10YR to 5Y, value of 6 or 7, and chroma of 1 or less. Iron concentrations range from few to many in shades of yellow or brown and from few to common in shades of red. Reaction ranges from moderately acid to slightly alkaline.

Craigen Series

The Craigen series consists of very deep, moderately well drained, moderately permeable soils that formed in sandy and loamy sediments. These soils are on small forested ridges. Slope ranges from 0 to 2 percent. The soils of the Craigen series are loamy, siliceous, active, thermic Arenic Glossudalfs.

Typical pedon of Craigen loamy fine sand, 0 to 2 percent slopes; Jefferson County, Texas; about 14 miles southwest of Beaumont on Interstate Highway 10 to intersection of Farm Road 365, 2.1 miles west on Farm Road 365, 0.5 mile north on private road and 50 feet east in forest. (lat. 29 degrees 56 minutes 10 seconds N. and long. 94 degrees 17 minutes 55 seconds W.)

A—0 to 7 inches; dark grayish brown (10YR 4/2) loamy fine sand; weak medium subangular blocky structure; soft, friable, nonsticky, nonplastic; many fine, medium and coarse roots; common fine and medium interstitial pores; very strongly acid; clear wavy boundary.

E1—7 to 17 inches; mixed brown (10YR 5/3) and pale brown (10YR 6/3) loamy fine sand; weak coarse prismatic structure; soft, friable, nonsticky, nonplastic; many fine, medium, and coarse roots; common fine and medium interstitial pores; common medium distinct dark grayish brown (10YR 4/2) masses of A material; very strongly acid; clear wavy boundary.

E2—17 to 24 inches; pale brown (10YR 6/3) loamy fine sand; weak coarse prismatic structure; soft, friable, nonsticky, nonplastic; many fine and medium roots; common fine and medium interstitial pores; many medium distinct yellowish brown (10YR 5/4) and strong brown (7.5YR 5/6) iron concentrations, few fine distinct yellowish brown (10YR 5/6) iron concentrations; few fine faint gray (10YR 5/1) iron depletions; very strongly acid; clear wavy boundary.

E/B—24 to 32 inches; pale brown (10YR 6/3) loamy fine sand; weak medium subangular blocky structure; soft, friable, nonsticky, nonplastic; common fine and medium roots; common fine and medium interstitial pores; many medium faint light brownish gray (10YR 6/2) albic materials (E); 40 percent strong brown (7.5YR 5/6) B materials; 5 percent crawfish krotovina; very strongly acid; clear irregular boundary.

Bt/E1—32 to 37 inches; 35 percent pale brown (10YR 6/3) and 35 percent strong brown (7.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; slightly hard, firm, nonsticky, nonplastic; few fine roots between peds; common fine and medium interstitial pores; few discontinuous faint clay films on faces of peds; few fine and medium iron-manganese concentrations; discontinuous prominent yellowish red (5YR 4/6) iron concentrations in root channels and pores; 30 percent light brownish gray (10YR 6/2) albic materials (E); 5 percent crawfish krotovina; 20 percent brittle masses in Bt; very strongly acid; gradual wavy boundary.

Bt/E2—37 to 49 inches; 35 percent yellowish brown (10YR 5/6) and 35 percent strong brown (7.5YR 5/6) sandy clay; moderate medium prismatic structure parting to fine and medium subangular blocky; slightly hard, firm, nonsticky, nonplastic; few fine roots between peds; common fine and medium interstitial pores; few faint discontinuous clay films on surface of prisms and peds; prominent discontinuous yellowish red (5YR 4/6) iron concentrations in root channels and pores; 30 percent light brownish gray (10YR 6/2) albic materials (E); few fine and medium iron-manganese concentrations; 5 percent crawfish krotovina; 20 percent brittle masses in Bt; strongly acid; gradual wavy boundary.

Bt/E3—49 to 60 inches; strong brown (7.5YR 5/6) fine sandy loam; strong medium prismatic structure parting to fine and medium subangular blocky; slightly hard, firm, nonsticky, nonplastic; few fine roots between peds; common fine and medium interstitial pores; 35 percent grayish brown (10YR 5/2) iron depletions on faces of peds; continuous clay films on surface of prisms and peds; 20 percent light brownish gray (10YR 6/2) albic materials (E); prominent discontinuous yellowish red (5YR 4/6) iron concentrations in root channels and pores; 5 percent crawfish krotovina; slightly acid; gradual wavy boundary.

Btg/E1—60 to 72 inches; gray (10YR 5/1) fine sandy loam; strong medium prismatic structure parting to fine and medium subangular blocky; slightly hard, firm, nonsticky, nonplastic; few fine roots between peds; common fine and medium interstitial pores; continuous clay films on surface of prisms and peds; many medium prominent strong brown (7.5YR 5/6) iron concentrations with sharp boundaries; prominent discontinuous yellowish red (5YR 4/6) iron concentrations in root channels and pores; 20 percent light brownish gray (10YR 6/2) albic materials (E); 5 percent crawfish krotovina; slightly acid; gradual wavy boundary.

Btg/E2—72 to 80 inches; dark gray (10YR 4/1) fine sandy loam; strong medium prismatic structure parting to fine and medium subangular blocky; slightly hard, firm, nonsticky, nonplastic; few fine roots between peds; common fine and medium interstitial pores; continuous clay films on surface of prisms and peds; many medium prominent yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) iron concentrations with sharp boundaries; 20 percent gray (10YR 5/1) albic materials (E); 5 percent crawfish krotovina; moderately acid.

The thickness of the solum is more than 80 inches. Weighted average clay content of the particle-size control section ranges from 18 to 30 percent. The combined A and E horizons range from 20 to 40 inches thick. Aluminum saturation ranges from 15 to 25 percent in the A horizon, 40 to 60 percent in the E horizons, 50 to 80 percent in the E/B and Bt/E1, and 20 to 50 percent in the lower Bt/E and Btg/E horizons. Redoximorphic features are considered both contemporary and relict. This soil does not have aquic soil conditions in most years in the upper 40 inches.

The A horizon has hue of 10YR, value of 3 or 4, and a chroma of 1 or 2. Reaction ranges from extremely acid to strongly acid.

The E and E/B horizons have hue of 10YR, value of 3 to 6, and chroma of 2 to 6. Iron concentrations range from few to common in shades of brown. Reaction ranges from extremely acid to strongly acid.

The Bt/E horizons have hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2 to 6. Texture of the Bt is fine sandy loam, sandy clay loam, or sandy clay. Albic materials make up 15 to 40 percent of the horizon. They are in streaks and masses and on the surface of prisms. Redoximorphic features range from few to common in shades of brown and gray. Reaction is very strongly acid or strongly acid.

The Btg/E horizons have hue of 10YR, value of 4 to 6, and chroma of 1 to 3. Texture is fine sandy loam or sandy clay loam. Albic materials make up 15 to 40 percent of the horizon. They are in streaks and masses and on the surface of prisms. Redoximorphic features range from few to common in shades of brown and gray. Reaction ranges from strongly acid to slightly acid.

Creole Series

The Creole series consists of very deep, very poorly drained, very slowly permeable saline soils that formed in thick unconsolidated clayey sediments that are permanently saturated with water. These soils are in broad marshes. Slopes are 0 to 1 percent, but typically less than 0.5 percent. The soils of the Creole series are fine, smectitic, nonacid, hyperthermic Typic Hydraquents.

Typical pedon of Creole mucky peat, 0 to 1 percent slopes, frequently flooded, tidal; Jefferson County, Texas; from Sabine Pass, 10 miles west on Texas Highway 87, 0.25 miles north on State Park road to boat ramp, 1.25 miles north in ditch and 50 feet west of ditch in marsh. (lat. 29 degrees 42 minutes 04 seconds N. and Latitude 94 degrees 02 minutes 02 seconds W.)

Oe—0 to 7 inches; dark gray (N 4/) mucky peat; massive; about 60 percent fiber, 30 percent rubbed; very fluid, flows easily between fingers leaving mainly roots in hand (n value of 1.0); many fine to coarse roots; neutral; slightly saline; clear smooth boundary.

A—7 to 13 inches; dark gray (N 4/) clay; massive; few strata of gray (N 5/) about 1 to 3 centimeters thick; fluid, flows with difficulty between fingers leaving large residue; many medium and coarse roots; slightly alkaline; slightly saline; gradual smooth boundary.

Cg1—13 to 22 inches; gray (N 6/) clay; massive; fluid, flows with difficulty between fingers leaving large residue; common fine roots; common very fine iron-manganese concretions and masses; slightly alkaline; moderately saline; gradual smooth boundary.

Cg2—22 to 34 inches; gray (N 6/) clay; massive; fluid, flows with difficulty between fingers leaving large residue; common fine roots; common very fine iron-manganese concretions and masses; few very fine white masses and concretions; slightly alkaline; moderately saline; gradual smooth boundary.

Cg3—34 to 58 inches; gray (N 6/) clay; massive; very fluid, flows easily between fingers leaving small residue in hand (n value of 1.0); many thin horizontal seams of light gray (N 7/); moderately acid; moderately saline; gradual smooth boundary.

Cg4—58 to 80 inches; dark gray (5Y 4/1) clay; massive; very fluid, flows easily between fingers leaving small residue in hand (n value of 1.0); neutral; strongly saline.

Except for thin surface layers, n values range from 0.7 to 1.0 to depths of 29 to 40 inches. Below this depth the n value is 1.0 or more. The electrical conductivity of the saturation extract ranges from 4 to 16 dS/m in most layers within a depth of 40 inches and ranges to strongly saline in the lower part. The particle-size control section contains 35 to 60 percent clay, though subhorizons within the 10- to 40-inch control section may contain less than 35 percent or more than 60 percent clay. Some pedons have an organic surface layer 2 to 8 inches thick.

The A horizon has hue of 10YR to 5Y, value of 2 to 6, and chroma of 1, or it is neutral and has value of 3 or 4. Texture is silty clay, clay, or mucky clay. Reaction ranges from very strongly acid to slightly alkaline.

The Cg horizon has hue of 10YR to 5BG, value of 4 to 6, and chroma of 1, or is neutral and has value of 4 to 6. Iron concentrations are in shades of olive brown or yellowish brown. Texture is silty clay or clay. Reaction ranges from moderately acid to moderately alkaline.

Estes Series

The Estes series consists of very deep, somewhat poorly drained, very slowly permeable clayey soils that formed in clayey sediments. These soils are on broad forested flood plains. Slopes are 0 to 1 percent. The soils of the Estes series are fine, smectitic, thermic Aeric Dystraquerts.

Typical pedon of Estes clay, 0 to 1 percent slopes, frequently flooded; Orange County, Texas; from the intersection of Texas Highway 105 and Farm Road 1131 about 4 miles north of Vidor, 4.1 miles west on Farm Road 1131, 1.9 miles west southwest on county road, 0.2 miles south on county road and 2,000 feet west of road in forest. (lat. 30 degrees 11 minutes 05 seconds N. and Latitude 94 degrees 06 minutes 19 seconds W.)

A—0 to 4 inches; brown (10YR 4/3) clay with common medium distinct masses of dark gray (10YR 4/1); weak medium granular structure; slightly hard, firm; very strongly acid; clear smooth boundary.

Bw—4 to 11 inches; strong brown (7.5YR 5/6) clay; weak medium subangular blocky structure; very hard, very firm; many fine distinct light brownish gray (10YR 6/2) redoximorphic depletions; very strongly acid; clear smooth boundary.

Bg—11 to 23 inches; light brownish gray (10YR 6/2) clay; weak medium subangular blocky structure; very hard, extremely firm; few small pressure faces and a few slickensides; common medium distinct strong brown (7.5YR 5/6) redoximorphic concentrations; very strongly acid; gradual wavy boundary.

Bssg—23 to 80 inches; light brownish gray (10YR 6/2) clay; weak medium subangular blocky structure; hard, firm; few large slickensides; common medium distinct strong brown (7.5YR 5/6) a few medium distinct red (2.5YR 4/6) iron concentrations; strongly acid; gradual wavy boundary.

The thickness of the solum is more than 80 inches. The weighted average clay content of the particle-size control section ranges from 40 to 50 percent. This is a cyclic soil and undisturbed areas have gilgai microrelief with microhighs 6 to 10 inches higher than microlows. Distance from the center of the microhigh to the center of the microlow ranges from about 4 to 12 feet. Cracks more than 0.5 inch wide extend from the surface to a depth of more than 12 inches when the soil is dry. The cracks remain open for less than 90 cumulative days in most years. Slickensides begin at a depth of 18 to 40 inches and extend for more than 20 inches.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3. Redoximorphic features in shades of brown or gray range from none to common. Reaction ranges from extremely acid to moderately acid.

The Bw horizon, where present, has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 6. Redoximorphic features in shades of brown or gray range from few to many. Reaction is extremely acid to strongly acid.

The Bg horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. Redoximorphic features in shades of red, yellow, brown, or gray range from few to many. Pressure surfaces and small slickensides range from none to few. Reaction is extremely acid to strongly acid.

The Bssg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. Redoximorphic features in shades of red, yellow, brown, or gray range from few to many. Pressure surfaces and slickensides range from common to many. Some pedons have threads, masses, or crystals of gypsum and/or barite commonly below the control section. Reaction is extremely acid or strongly acid.

The BCg horizon, where present, has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 1 or 2. Texture is sandy clay loam, silty clay loam, or clay loam. Redoximorphic features in shades of red, yellow, or brown range from few to many. Some pedons have a mixed matrix of these colors. Reaction ranges from extremely acid to moderately acid.

Evadale Series

The Evadale series consists of very deep, poorly drained, very slowly permeable soils that formed in loamy and clayey sediments. These soils are on broad forested flatwoods. Slopes are 0 to 1 percent. The soils of the Evadale series are fine, smectitic, thermic Typic Glossaqualfs.

Typical pedon of Evadale silt loam, 0 to 1 percent slopes; Orange County, Texas; from the intersection of Farm Road 2802 and Farm Road 105 about 7 miles north of Vidor, 4.2 miles east on Farm Road 2802 and 200 feet north in forest. (lat. 30 degrees 14 minutes 00 seconds N. and Latitude 93 degrees 56 minutes 34 seconds W.)

A—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam; weak medium prismatic structure; hard, friable, nonsticky, nonplastic; many fine and medium roots; common fine and medium tubular pores; very strongly acid; clear wavy boundary.

E—5 to 9 inches; light brownish gray (10YR 6/2) silt loam; moderate fine subangular blocky structure; hard, friable, nonsticky, nonplastic; common fine and medium roots; common fine tubular pores; few fine prominent yellowish brown (10YR 5/8) stains along old root channels; very strongly acid; gradual wavy boundary.

E1/Bt—9 to 14 inches; light brownish gray (10YR 6/2) silt loam; moderate medium subangular blocky structure; about 20 percent dark grayish brown (10YR 4/2) silty clay loam B bodies; hard, friable, nonsticky, nonplastic; common fine roots; common fine prominent yellowish brown (10YR 5/8) and dark yellowish brown (10YR 4/4) iron concentrations along old root channels; very strongly acid; gradual wavy boundary.

E2/Bt—14 to 22 inches; grayish brown (10YR 5/2) silt loam; moderate medium subangular blocky structure; about 40 percent dark grayish brown (10YR 4/2) silty clay loam B bodies; hard, friable, nonsticky, nonplastic; few fine roots; common fine prominent yellowish brown (10YR 5/8) iron concentrations along old root channels; very strongly acid; gradual wavy boundary.

Btg/E—22 to 34 inches; grayish brown (10YR 5/2) silty clay; about 15 percent light brownish gray (10YR 6/2) streaks and pockets of silt loam E material 5 to 20 millimeters thick; moderate medium prismatic structure parting to weak medium blocky; extremely hard, extremely firm, very sticky, very plastic; few fine roots; common fine prominent brownish yellow (10YR 6/6) and yellowish brown (10YR 5/8) iron concentrations; very strongly acid; gradual wavy boundary.

2Btg1—34 to 46 inches; grayish brown (10YR 5/2) silty clay; moderate medium prismatic structure parting to weak medium blocky; extremely hard, extremely firm, very sticky, very plastic; few fine roots; common fine prominent brownish yellow (10YR 6/6) and few fine prominent brown (7.5YR 5/4) iron concentrations; very strongly acid; gradual wavy boundary.

2Btg2—46 to 55 inches; light brownish gray (10YR 6/2) silty clay; moderate medium prismatic structure parting to weak medium blocky; extremely hard, extremely firm, very sticky, very plastic; few fine roots; common fine prominent brownish yellow (10YR 6/6) iron concentrations; few iron-manganese concretions up to 5 mm; very strongly acid; gradual wavy boundary.

2Btg3—55 to 70 inches; gray (10YR 6/1) silty clay; moderate medium prismatic structure parting to weak medium blocky; extremely hard, extremely firm, very sticky, very plastic; few fine roots; common fine prominent light olive brown (2.5Y 5/6) iron concentrations and common fine and medium prominent light greenish gray (5BG 7/1) iron depletions; few iron-manganese concretions up to 5 millimeters; strongly acid; gradual wavy boundary.

2Btg4—70 to 80 inches; gray (10YR 6/1) silty clay; moderate medium prismatic structure parting to weak medium blocky; extremely hard, extremely firm, very sticky, very plastic; few fine roots; common fine prominent light olive brown (2.5Y

5/6) and yellowish brown (10YR 5/8) iron concentrations, and common fine and medium prominent light greenish gray (5BG 7/1) iron depletions; few iron-manganese concretions up to 5 millimeters; strongly acid.

The thickness of the solum is more than 80 inches. Weighted average clay content of the particle-size control section ranges from 35 to 45 percent with silt exceeding 30 percent. The glossic horizon ranges from 10 to 20 inches thick. Gypsum crystals and masses of barite range from none to common below 40 inches. Sodium adsorption ratio (SAR) is less than 2 throughout. Electrical conductivity is less than 2 throughout.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 to 3. Texture is loam, silt loam, or very fine sandy loam. Reaction ranges from extremely acid to moderately acid.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Texture is loam, silt loam, or very fine sandy loam. Iron concentrations are in shades of red, yellow, or brown. Reaction ranges from extremely acid to moderately acid.

The Btg/E horizon has hue 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. Texture is silty clay loam or clay loam. Iron concentrations in shades of red, yellow, and brown have hue 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8. Reaction ranges from extremely acid to moderately acid.

The 2Btg/E horizon, where present, has hue 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. Texture is clay or silty clay. The E part has hue 10YR and 2.5Y, value 5 to 7, and chroma 1 or 2. Iron concentrations in shades of red, yellow, and brown have hue 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8 and range from common to many. Iron depletions are in shades of gray. Reaction ranges from extremely acid to moderately acid.

The 2Btg horizons have hue 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. Texture is clay or silty clay. The E part has hue 10YR and 2.5Y, value 5 to 7, and chroma 1 or 2. Iron concentrations in shades of red, yellow, and brown have hue 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8 range from few to common. Iron depletions are in shades of gray. Reaction ranges from very strongly acid to moderately acid.

The 2BC horizon, where present, has hue 10YR or 2.5Y, value of 5 or 6, and chroma of 3 to 6. Redox concentrations in shades of red, yellow, brown, and gray range from few to common. Texture is clay or silty clay. Reaction ranges from very strongly acid to moderately acid.

Fausse Series

The Fausse series consists of very deep, very poorly drained, very slowly permeable soils that formed in thick clayey sediments. These soils are on forested flood plains. Slopes are 0 to 1 percent. The soils of the Fausse series are very fine, smectitic, nonacid, hyperthermic Vertic Endoaquepts.

Typical pedon of Fausse clay, 0 to 1 percent slopes, frequently flooded; Orange County, Texas; from the intersection of Texas Highway 105 and Farm Road 1131 about 4 miles north of Vidor, 3.3 miles west on Farm Road 1131, 3.9 miles south west on county road and 200 feet east in forest. (lat. 30 degrees 09 minutes 50 seconds N. and Latitude 94 degrees 06 minutes 35 seconds W.)

A—0 to 6 inches; gray (10YR 6/1) clay; moderate medium granular structure; very hard, very firm, sticky, plastic; many fine to medium roots; strongly acid; clear wavy boundary.

Bg1—6 to 14 inches; gray (10YR 6/1) clay; moderate medium blocky structure; extremely hard, very firm, very sticky, plastic; common fine roots; common fine and medium distinct olive (5Y 5/6) iron concentrations; strongly acid; clear smooth boundary.

Bg2—14 to 26 inches; light gray (10YR 7/1) clay; moderate medium blocky structure; extremely hard, very firm, very sticky, plastic; few fine roots; many fine and medium prominent brownish yellow (10YR 6/8) iron concentrations; extremely acid; gradual wavy boundary.

Bg3—26 to 55 inches; gray (10YR 6/1) clay; moderate medium blocky structure; extremely hard, very firm, very sticky, plastic; few fine roots; many fine and medium prominent brownish yellow (10YR 6/8) iron concentrations; extremely acid; gradual wavy boundary.

Bg4—55 to 68 inches; light gray (10YR 7/1) clay; moderate medium blocky structure; extremely hard, very firm, very sticky, plastic; few fine roots; few iron-manganese concretions to 5 millimeters; many fine and medium prominent brownish yellow (10YR 6/8) and many fine prominent brown (7.5YR 4/4) iron concentrations; extremely acid; gradual wavy boundary.

Bg5—68 to 80 inches; gray (2.5Y 6/1) clay; moderate medium blocky structure; extremely hard, very firm, very sticky, plastic; few fine roots; very strongly acid.

The soil is saturated or above field capacity continuously in all layers below 24 inches in most years. COLE ranges from 0.09 to 0.18 in all mineral layers. The n value is variable within 36 inches of the soil surface but is 0.7 or less in some subhorizons in the 8- to 20-inch section. Cracks do not form to a depth of 20 inches below the soil surface in most years.

The A horizon has hue of 10YR or N, value of 3, and chroma of 0 to 2. Texture is mucky clay or clay. Where the A horizon is very dark gray or very dark grayish brown, it is less than 10 inches thick. Reaction in the A horizon ranges from strongly acid to neutral, except in areas where salt water has encroached.

The B horizon has hue of 10YR or N, value of 4 to 7, and chroma of 0 to 1. Texture is clay. Iron concentrations in shades of brown range from none to common. Reaction ranges from extremely acid to moderately alkaline.

The Cg horizon, where present, has hue of 5Y, 5GY, 5GB or N, value of 4 or 5, and chroma of 1 or less. Texture is clay, silty clay, or silty clay loam. Reaction is extremely acid to neutral. Organic carbon decreases irregularly with depth and is more than 0.2 percent at 50 inches below the soil surface.

Franeau Series

The Franeau series consists of very deep, poorly drained, very slowly permeable soils that formed in clayey sediments. These soils are in broad marshes. Slopes are 0 to 1 percent. The soils of the Franeau series are fine, smectitic, hyperthermic Typic Natraquerts.

Typical pedon of Franeau clay, 0 to 1 percent slopes; in Jefferson County, Texas; from the intersection of Texas Highway 124 and Texas Highway 73 southwest of Hampshire, 2 miles west on Texas Highway 73, 12.55 miles south on Texas Highway 124, 1.7 miles east on private Shell road, 1.05 miles south-southeast on Shell road, 1,700 feet south-southeast to fence and 500 feet southeast in rangeland. (lat. 29 degrees 37 minutes 36 seconds N. and long. 94 degrees 20 minutes 19 seconds W.)

A1—0 to 4 inches; black (10YR 2/1) clay; moderate very fine blocky and subangular blocky structure; very hard, very firm; common fine and medium roots; few fine pores; slightly sodic; very slightly saline; slightly acid; gradual wavy boundary.

A2—4 to 16 inches; black (10YR 2/1) clay; moderate fine blocky and subangular blocky structure; very hard, extremely firm; common fine and medium roots; few fine pores; common pressure faces; slightly sodic; very slightly saline; slightly acid; gradual wavy boundary.

Bssg1—16 to 21 inches; very dark gray (10YR 3/1) clay; moderate fine and medium angular blocky structure; extremely hard, extremely firm; common fine and medium roots; few fine pores; common prominent slickensides; common pressure faces; few fine iron-manganese concretions; slightly sodic; very slightly saline; slightly acid; gradual wavy boundary.

Bssg2—21 to 27 inches; very dark gray (10YR 3/1) clay; moderate medium angular blocky structure; extremely hard, extremely firm; few fine and medium roots; few fine pores; common prominent slickensides; common pressure faces; few fine distinct yellowish brown (10YR 5/4) iron concentrations; few fine iron-manganese concretions; moderately sodic; slightly saline; neutral; gradual wavy boundary.

Bssg3—27 to 42 inches; gray (10YR 5/1) clay; moderate medium and coarse angular blocky structure; extremely hard, extremely firm; few fine and medium roots; few fine pores; common prominent slickensides; common pressure faces; common medium prominent brownish yellow (10YR 6/6) iron concentrations; few fine iron-manganese concretions; moderately sodic; slightly saline; neutral; gradual wavy boundary.

Bssg4—42 to 54 inches; gray (2.5Y 6/1) clay; strong medium and coarse angular blocky structure; extremely hard, extremely firm; few fine roots; few fine pores; common prominent slickensides; common pressure faces; common medium prominent brownish yellow (10YR 6/6) iron concentrations; few fine iron-manganese concretions; moderately sodic; slightly saline; neutral; gradual wavy boundary.

Bssg5—54 to 61 inches; gray (2.5Y 6/1) clay; strong medium and coarse angular blocky structure; extremely hard, extremely firm; common prominent slickensides; common pressure faces; common medium prominent brownish yellow (10YR 6/6) iron concentrations; few fine iron-manganese concretions; moderately sodic; slightly saline; neutral; gradual wavy boundary.

Bssg6—61 to 80 inches; gray (2.5Y 6/1) clay; moderate medium and coarse angular blocky structure; extremely hard, extremely firm; few fine roots; common prominent slickensides; common pressure faces; common medium prominent brownish yellow (10YR 6/6) iron concentrations; few fine and medium iron-manganese concretions; moderately sodic; slightly saline; moderately alkaline; gradual wavy boundary.

The thickness of the solum is more than 80 inches. The clay content of the particle-size control section ranges from 45 to 60 percent. This is a cyclic soil and undisturbed areas have gilgai microrelief with microhighs 4 to 6 inches higher than microlows. Distance from the center of the microhigh to the center of the microlow ranges from about 8 to 16 feet. The amplitude of waviness between mollic colored materials in the upper part of the solum and the higher value colors in the lower part ranges from about 10 to 30 inches. The chimneys of high value materials on the microhigh make up less than 5 percent of the surface area. They are mainly 5 to 10 feet long and 3 to 5 feet wide. When dry, the soil has cracks 0.5 to 2 inches wide at the surface and commonly 0.5 inch wide cracks extend to a depth of 2 feet during the summer. Slickensides begin at a depth of 12 to 24 inches and extend throughout the solum. Iron-manganese concretions, mainly less than 0.25 inch in diameter, range from none to a few throughout, and are mainly in the lower part of the solum. SAR ranges from 6 to 13 in the A horizon, and 13 to 30 in the Bssg horizon. Conductivity of the saturation extract ranges from 1 to 4 dS/m in the A horizon, and 2 to 8 dS/m in the rest of the pedon. These soils have aquic conditions in most years.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1. Iron concentrations in shades of brown range from none to common. Reaction is slightly acid or neutral.

The Bssg horizon has neutral colors with value of 6 or 7, or have hue of 10YR, value of 3 to 7, and chroma of 1 or 2, or hue of 2.5Y, value of 6 or 7, and chroma of 1. Iron concentrations in shades of yellow or brown range from few to common. Reaction is neutral in the upper part to moderately alkaline in the lower part. In some pedons the cycle below 60 inches has 2 to 5 percent concretions of calcium carbonate. Reaction is moderately alkaline.

Gist Series

The Gist series consists of very deep, moderately well drained, very slowly permeable soils that formed in loamy and clayey sediments. These soils are on circular mounds 40 to 100 feet in diameter and 1 to 3 feet high on broad forested flatwoods. Slopes are 0 to 1 percent, but typically less than 1 percent. The soils of the Gist series are coarse-silty, siliceous, superactive, thermic Oxyaquic Glossudalfs.

Typical pedon of Gist very fine sandy loam in an area of Texla-Gist complex, 0 to 1 percent slopes; Orange County; from the intersection of Texas Highway 87 and Interstate Highway 10 in Orange, 7.5 miles north on Texas Highway 87, 1.1 miles east on paved road and 600 feet south of road in forest. (lat. 30 degrees 13 minutes 34 seconds N. and Latitude 93 degrees 45 minutes 05 seconds W.)

A—0 to 5 inches; dark grayish brown (10YR 4/2) very fine sandy loam; weak moderate granular structure; soft, friable, nonsticky, nonplastic; many fine to coarse roots; extremely acid; clear wavy boundary.

E—5 to 20 inches; pale brown (10YR 6/3) very fine sandy loam; weak medium subangular blocky structure; soft, friable, nonsticky, nonplastic; common fine to coarse roots; extremely acid; clear wavy boundary.

Bt&E1—20 to 28 inches; 50 percent light yellowish brown (10YR 6/4) and yellowish brown (10YR 5/6) loam (Bt); 50 percent pale brown (10YR 6/3) loam (E1); moderate medium prismatic structure parting to moderate weak blocky; slightly hard, friable, nonsticky, nonplastic; common fine and medium roots; many small and medium pores; few iron-manganese concretions; extremely acid; clear wavy boundary.

Bt&E2—28 to 38 inches; 60 percent brownish yellow (10YR 6/8) and yellowish brown (10YR 5/8) loam (Bt); 40 percent pale brown (10YR 6/3) and gray (10YR 6/1) loam (E2); moderate medium prismatic structure parting to moderate weak blocky; slightly hard, friable, nonsticky, nonplastic; common fine and medium roots; few pores in E material; few iron-manganese concretions; the yellowish brown (10YR 5/8) colors are brittle bodies; extremely acid; clear wavy boundary.

Bt&E3—38 to 50 inches; 75 percent yellowish brown (10YR 5/8) and strong brown (7.5YR 5/8) loam (Bt); 25 percent gray (10YR 6/1) loam (E3); weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, friable, nonsticky, nonplastic; few fine roots; few iron-manganese concretions; 30 percent of the matrix is brittle; very strongly acid; abrupt wavy boundary.

2Btg1—50 to 60 inches; grayish brown (10YR 5/2) clay; moderate medium prismatic structure parting to weak medium subangular blocky; very hard, very firm, very sticky, plastic; few small and common large pressure faces; many coarse red (2.5YR 5/8) and common strong brown (7.5YR 5/6) iron concentrations; few dark grayish brown (10YR 4/2) clay films; very strongly acid; gradual smooth boundary.

2Btg2—60 to 80 inches; mottled light brownish gray (10YR 6/2) and gray (10YR 6/1) silty clay loam; moderate prismatic structure parting to weak medium subangular blocky; very hard, very firm, very sticky, plastic; many fine prominent red (2.5YR 4/8) and common fine prominent strong brown (7.5YR 5/6) iron concentrations; very strongly acid.

The thickness of the solum is more than 80 inches.

Texture of the A and E horizons are very fine sandy loam, loam, or silt loam. The A horizon has hue of 10YR, value of 4 and 5, and chroma of 2. Reaction ranges from extremely acid to moderately acid.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 2 to 4.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. The albic materials (E) have hue of 10YR, value of 6 or 7, and chroma of 1 to 4. The Bt/E horizons have textures of loam or silt loam with clay content less than 18 percent and with less than 15 percent coarser than very fine sand. Redoximorphic features in shades of yellow, brown, or gray range from few to common. In some pedons the lower part of this horizon has up to 25 percent brittleness. Reaction ranges from extremely acid to strongly acid.

The lower Bt horizons have hue of 10YR, value of 5 or 6, and chroma of 1 or 2. Textures are clay loam, silty clay, or clay. The upper parts of these horizons have very fine sandy loam or silt loam albic material that is light gray in color. The volume of albic material diminishes with depth. Iron concentrations are in shades of red, brown, and yellow. In some pedons, at depths more than 70 inches, reaction ranges to neutral.

Harris Series

The Harris series consists of very deep, very poorly drained, very slowly permeable saline soils that formed in thick clayey sediments. These soils are in broad marshes. Slopes are 0 to 1 percent, but typically less than 1 percent. The soils of the Harris series are fine, smectitic, hyperthermic Vertic Endoaquolls.

Typical pedon of Harris clay, 0 to 1 percent slopes, frequently flooded, tidal; Jefferson County; from the intersection of Texas Highway 73 and 124 near Winnie, 7.0 miles east on Texas Highway 73, 4.2 miles south on private road, 3.75 miles south and east on private road, 0.6 miles south on private road, 4.0 miles east and south on private road and 900 feet west of road in range. (lat. 29 degrees 42 minutes 19 seconds N. and Latitude 93 degrees 52 minutes 07 seconds W.)

A1—0 to 3 inches; very dark gray (10YR 3/1) clay; weak medium blocky structure; slightly fluid; very hard, very firm, very sticky, plastic; many fine and medium roots; very strongly acid; very slightly saline; clear smooth boundary.

A2—3 to 22 inches; very dark gray (N 3/) clay; weak medium blocky structure; very hard, very firm, very sticky, plastic; many fine and medium roots; common fine distinct yellowish brown (10YR 5/4) iron concentrations; strongly acid; slightly saline; clear smooth boundary.

Bg1—22 to 55 inches; gray and light gray (N 6/ and N 7/) clay; massive; very hard, very firm, very sticky, plastic; common fine roots; common medium distinct dark gray (10YR 4/1) and common medium and coarse distinct yellowish brown (10YR 5/4) iron concentrations; strongly acid; slightly saline; gradual smooth boundary.

Cg—55 to 80 inches; light gray (N 7/) clay; massive; very hard, very firm, very sticky, plastic; strongly acid; slightly saline.

The thickness of the solum ranges from 40 to 60 inches. The particle-size control section averages between 40 and 60 percent clay. The soil is saturated to the surface for periods of 4 to 8 months and seldom dries to below field capacity. Soil salinity is slight or moderate. Reaction ranges from very strongly acid to strongly alkaline throughout the soil. The soil has less than 15 percent saturation with sodium in the upper 20 inches, or the sodium saturation is constant or increases with depth below 20 inches.

The A horizon has hue of 10YR, 5Y, or N, value of 2 or 3, and chroma of 1 or less. Texture is clay, but some pedons have a thin loamy overwash. Some pedons have an organic surface horizon less than 4 inches thick. The total thickness of the A horizon ranges from 10 to 24 inches. The organic matter content ranges from 2 to 15 percent and is highest in the upper part. Iron concentrations in shades of yellow or brown range from none to common.

The Bg and C horizons have hue of 10YR, 5Y, or N, values of 4 to 7, and chroma of 1 or less. Texture is clay or silty clay. Iron features, mainly iron-manganese and iron concentrations are in shades of yellow and brown range from few to common. Iron depletions, in various stages of reduction, are in shades of gray and range from few to common.

Some pedons have a 2C horizon below a depth of 60 inches. The matrix color is the same as the B and C horizons, but may contain red, brown, or yellow strata. Texture ranges from loam to clay.

Ijam Series

The Ijam series consists of very deep, poorly drained, very slowly permeable soils that formed from materials dredged from rivers, bays, and canals. These soils are in marshes. Slope ranges from 0 to 2 percent. The soils of the Ijam series are fine, smectitic, nonacid, hyperthermic Vertic Fluvaquents.

Typical pedon of Ijam clay, 0 to 2 percent slopes, frequently flooded, tidal; Jefferson County, Texas; from U S Highway 87 and the Chambers County line, 4.3 miles northeast on U S Highway 87, 3.2 miles north on cattle walkway and 1,450 feet west in range. (lat. 29 degrees 37 minutes 27 seconds N. and long. 94 degrees 18 minutes 49 seconds W.)

A—0 to 6 inches; grayish brown (10YR 5/2) clay; moderate medium angular blocky structure; extremely hard, extremely firm; many fine and very fine roots; common fine prominent strong brown (7.5YR 4/6) and (7.5YR 5/8) iron concentrations; few oyster shells on surface; very strongly acid; clear wavy boundary.

C1—6 to 23 inches; light brownish gray (2.5Y 6/2) clay; moderate medium angular blocky structure; extremely hard, extremely firm; common fine and medium roots; many medium prominent brownish yellow (10YR 6/6) and common medium prominent dark yellowish brown (10YR 4/4) iron concentrations; common coarse very dark gray (10YR 3/1) bodies; slightly saline; neutral; gradual wavy boundary.

C2—23 to 65 inches; mottled yellowish brown (10YR 5/4) and light brownish gray (10YR 6/2) clay; massive; extremely hard, extremely firm; common medium distinct brownish yellow (10YR 6/6) and yellowish brown (10YR 5/8) iron concentrations; few concentrations of calcium carbonate; few very coarse loamy bodies up to 12 centimeters and many coarse very dark gray (10YR 3/1) bodies; moderately saline; neutral.

C3—65 to 80 inches; light gray (10YR 7/2) clay; massive; extremely hard, extremely firm; many medium prominent brownish yellow (10YR 6/6) iron concentrations; few concentrations of calcium carbonate; many coarse very dark gray (10YR 3/1) bodies; moderately saline; neutral.

These soils are saturated with water from 3 to 6 months during the year. Reaction ranges from very strongly acid to moderately alkaline throughout. Some layers are calcareous but carbonates are not continuous in all parts between 10 and 20 inches. Electrical conductivity ranges from 4 to 16 dS/m throughout.

The A horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma 2 or less.

The Cg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma 2 or less. Some pedons have color of bluish gray (5B 6/1). The texture of the 10- to 40-inch particle-size control section is clay, with the clay content ranging from 40 to 55 percent. Pockets, lenses, or thin strata of sandy or loamy sediments occur at random throughout the pedon. There are few to common masses of iron accumulation in shades of yellowish brown or strong brown.

Labelle Series

The Labelle series consists of very deep, somewhat poorly drained, very slowly permeable soils that formed in loamy and clayey sediments. These soils are on broad prairies. Slopes are 0 to 1 percent. The soils of the Labelle series are fine, smectitic, hyperthermic Oxyaquic Vertic Argiudolls.

Typical pedon of Labelle silt loam, 0 to 1 percent slopes (fig. 32); Jefferson County, Texas; from the intersection of U.S. Highway 90 and Farm Road 364 on the west side of Beaumont, 8 miles west on U.S. Highway 90, 0.75 miles north on county road, 0.5 mile west and 0.65 miles north on farm road and 75 feet east in field. (lat. 30 degrees 04 minutes 28 seconds N. and long. 94 degrees 18 minutes 09 seconds W.)

Ap—0 to 6 inches; very dark gray (10YR 3/1) silt loam; weak medium subangular blocky structure; slightly hard, friable; common fine roots; few fine pores; few medium faint dark brown (10YR 3/3) iron concentrations with diffuse boundaries; slightly acid; clear smooth boundary.

Bt1—6 to 12 inches; black (10YR 2/1) silty clay loam; moderate medium prismatic structure parting to moderate fine angular blocky; hard, very firm; common fine roots; few fine pores; common medium distinct dark brown (10YR 3/3) iron concentrations with clear boundaries; neutral; clear wavy boundary.

Bt2—12 to 18 inches; very dark gray (10YR 3/1) silty clay; moderate medium prismatic structure parting to moderate fine angular blocky; very hard, very firm; few fine roots; few fine pores; few pressure faces; few fine distinct brown (10YR 4/3) and fine prominent dark yellowish brown (10YR 4/6) iron concentrations with clear boundaries; neutral; gradual wavy boundary.

Figure 32.—Profile of Labelle silt loam, 0 to 1 percent slopes. The dark colored loamy surface contacts the clayey subsoil at a depth of 1.25 feet. Concretions of calcium carbonate occur at a depth of 4 feet.

Bt3—18 to 30 inches; dark gray (10YR 4/1) silty clay; moderate medium angular blocky structure; very hard, very firm; few fine roots; few fine pores; common pressure faces; common medium distinct yellowish brown (10YR 5/4) iron concentrations with clear boundaries; neutral; gradual wavy boundary.

Btssg1—30 to 50 inches; gray (2.5Y 5/1) silty clay; moderate fine angular blocky structure; very hard, very firm; few fine roots; few fine pores; common pressure faces; few prominent slickensides; common medium distinct light olive brown (2.5Y 5/4) iron concentrations with clear boundaries; slightly alkaline; gradual wavy boundary.

Btssg2—50 to 80 inches; gray (2.5Y 6/1) silty clay; moderate medium angular blocky structure; very hard, very firm; few fine roots; few fine pores; common pressure faces; few prominent slickensides; common medium light olive brown (2.5Y 5/4) iron concentrations with clear boundaries; few iron-manganese concretions less than 3 millimeters in diameter; few fine concretions of calcium carbonate; slightly alkaline; gradual wavy boundary.

The thickness of the solum is more than 80 inches. Weighted average clay content of the particle-size control section ranges from 35 to 45 percent. The mollic epipedon ranges from 10 to 24 inches thick. The soil is usually moist, but during the summer of some years cracks 0.5 to 1 inch wide extend to a depth of more than 20 inches. Depth to wedge-shaped peds and slickensides ranges from 20 to 30 inches. Linear extensibility ranges from 6.0 to 8.0 centimeters in the upper 40 inches of the soil. The surface layer is saturated 30 to 40 days mainly during late winter and early spring. Redoximorphic features are considered both contemporary and relict. This soil does not have aquic conditions in most years in the upper 40 inches.

The Ap or A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. Iron concentrations range from few to common in shades of yellow or brown. Reaction ranges from strongly acid to slightly acid.

The Bt horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 in the upper part but ranges to a value of 5 in the lower part. Texture is silty clay or clay, except the upper few inches is silty clay loam. Redoximorphic features range from few to many in shades of yellow, brown, and gray. Reaction ranges from moderately acid to neutral.

The Btssg horizon has neutral color with value of 6 or 7 or has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1. Texture is silty clay or clay. Slickensides and wedge-shaped peds are few to common. Redoximorphic features range from common to many in shades of yellow, brown, or gray. Few to common iron-manganese concretions are present in most pedons. The lower part of most pedons have few to common pitted concretions of calcium carbonate. Reaction ranges from slightly acid to slightly alkaline.

Larose Series

The Larose series consists of very deep, very poorly drained, very slowly permeable soils that formed in unconsolidated clayey sediments. These soils are in broad bottomland marshes. Slopes are 0 to 1 percent, but typically less than 1 percent. The soils of the Larose series are very-fine, smectitic, nonacid, hyperthermic Typic Hydraquents.

Typical pedon of Larose mucky peat, 0 to 1 percent slopes, frequently flooded; from the intersection of Texas Highway 73 and Taylor Bayou about 8 miles west of Port Arthur, 1.2 miles northwest in Taylor Bayou to the west shoreline, 50 feet west in range. (long. 94 degrees 04 minutes 04 seconds N. and Latitude 29 degrees 53 minutes 47 seconds W.)

Oe—0 to 5 inches; very dark gray (10YR 3/1) mucky peat; massive; about 40 percent fiber, 30 percent rubbed; very fluid, flows easily between fingers leaving mainly roots in hand (n value of 1.0); many fine to coarse roots; strongly acid; clear smooth boundary.

A—5 to 9 inches; very dark gray (10YR 3/1) mucky clay; massive; very fluid, flows easily between fingers leaving hand essentially empty; many fine and medium roots; very strongly acid; very slightly saline; gradual smooth boundary.

Cg1—9 to 22 inches; dark gray (2.5Y 4/1) clay; massive; very fluid, flows easily between fingers leaving hand essentially empty; many medium and coarse faint dark gray (N 4/) and common medium distinct very dark gray (N 3/) iron concentrations; moderately acid; very slightly saline; gradual smooth boundary.

Cg2—22 to 44 inches; gray (N 6/) clay; massive; very fluid, flows easily between fingers leaving hand essentially empty; many medium and coarse faint dark gray (N 4/), common medium distinct very dark gray (N 3/), and few fine prominent yellowish brown (10YR 5/6) iron concentrations; moderately acid; very slightly saline; gradual smooth boundary.

Cg3—44 to 80 inches; light gray (N 7/) clay; massive; very fluid, flows easily between fingers leaving hand essentially empty; many medium and coarse faint dark gray (N 4/), common medium distinct very dark gray (N 3/), and few fine prominent yellowish brown (10YR 5/6) iron concentrations; moderately acid; slightly saline; gradual smooth boundary.

The soils are continuously saturated with fresh water. All of the mineral horizons above a depth of 60 inches have an n value of 1.0 or more. Reaction ranges from very strongly acid to slightly alkaline in the O and A horizons and moderately acid to moderately alkaline in the Cg horizons.

The Oe horizon has hue of 7.5YR or 10YR, value of 2 or 4, and chroma of 1 or 2.

The A horizon has hue of 10YR to 5Y, value of 2 to 4, and chroma of 2 or less. Texture is clay, silty clay, or mucky clay.

The Cg horizon has hue of 10YR to 5BG or N, value of 3 to 7, and chroma of 2 or less. Texture is clay, silty clay, or mucky clay. Iron and iron-manganese concentrations range from none to few in shades of brown. Iron depletions, in various stages of reduction, range from none to few in shades of gray. Some pedons have thin organic layers within the C horizon. Also, some pedons have fine sand or loamy sand Cg horizons below a depth of 40 inches.

League Series

The League series consists of very deep, somewhat poorly drained, very slowly permeable soils that formed in clayey sediments. These soils are on broad prairies. Slopes are 0 to 1 percent. The soils of the League series are fine, smectitic, hyperthermic Oxyaquic Dystruderts.

Typical pedon of League clay, 0 to 1 percent slopes; Jefferson County, Texas; from the intersection of Interstate Highway 10 and U.S. Highway 90 in Beaumont, 16.5 miles west on U.S. Highway 90 to Nome, 3.0 miles south on Farm Road 365, 0.5 mile west on county road, 700 feet north on field road and 100 feet west of road in cropland. (lat. 29 degrees 59 minutes 42 seconds N. and long. 94 degrees 24 minutes 59 seconds W.)

Ap—0 to 6 inches; dark gray (10YR 4/1) clay, gray (10YR 5/1) dry; massive; extremely hard, extremely firm, very sticky, very plastic; many fine roots; common fine pores; 5 percent strong brown (7.5YR 5/6) iron concentrations along root channels and pores; many fine prominent strong brown (7.5YR 4/6) iron concentrations on faces of peds; very strongly acid; abrupt smooth boundary.

A—6 to 11 inches; very dark gray (10YR 3/1) clay, dark gray (10YR 4/1) dry; massive; extremely hard, extremely firm; many fine roots; common fine pores; 5 percent strong brown (7.5YR 5/6) iron concentrations along root channels and pores; very strongly acid; abrupt smooth boundary.

Bss1—11 to 22 inches; very dark gray (10YR 3/1) clay, dark gray (10YR 4/1) dry; weak coarse prismatic structure parting to weak coarse angular blocky; extremely hard, extremely firm; few fine roots; few fine pores; common prominent pressure faces; few prominent slickensides; few fine prominent yellowish brown (10YR 5/4) iron concentrations; about 5 percent strong brown (7.5YR 5/6) iron concentrations along root channels and pores; very strongly acid; gradual wavy boundary.

Bss2—22 to 30 inches; very dark gray (10YR 3/1) clay, dark gray (10YR 4/1) dry; weak coarse prismatic structure parting to weak coarse angular blocky; extremely hard, extremely firm; few fine roots; few fine pores; common prominent slickensides; few fine prominent yellowish brown (10YR 5/4) iron concentrations; very strongly acid; gradual wavy boundary.

Bss3—30 to 36 inches; dark gray (10YR 4/1) clay, gray (10YR 5/1) dry; weak coarse angular blocky structure; extremely hard, extremely firm; few fine roots; few fine pores; common prominent slickensides; few fine prominent light olive brown (2.5Y 5/6) iron concentrations; about 2 percent dark gray crayfish krotovina; very strongly acid; gradual wavy boundary.

Bssg1—36 to 46 inches; gray (2.5Y 5/1) clay, gray (2.5Y 6/1) dry; weak coarse angular blocky structure; extremely hard, extremely firm; few fine roots; few fine pores; many prominent slickensides; many medium faint dark gray (2.5Y 4/1) iron depletions, common medium distinct light olive brown (2.5Y 5/4), and few fine prominent yellowish brown (10YR 5/6) iron concentrations; about 5 percent dark gray crayfish krotovina with gray linings; strongly acid; gradual wavy boundary.

Bssg2—46 to 59 inches; gray (2.5Y 6/1) clay; weak coarse angular blocky; extremely hard, extremely firm; few fine roots; few fine pores; many prominent slickensides tilted about 50 degrees from horizontal; many fine and medium prominent brownish yellow (10YR 6/6) iron concentrations; about 5 percent dark gray crayfish krotovina with gray linings; slightly acid; diffuse wavy boundary.

Bssg3—59 to 80 inches; gray (2.5Y 6/1) clay; weak coarse angular blocky; extremely hard, extremely firm; few fine roots; few fine pores; many prominent slickensides tilted about 50 degrees from horizontal; common fine and medium prominent yellowish brown (10YR 5/6) and few fine prominent olive yellow (2.5Y 6/6) iron concentrations; about 5 percent dark gray crayfish krotovina with gray linings; neutral.

The range in characteristics includes 50 percent or more of the pedon. The thickness of the solum is more than 80 inches. Thickness of mollic epipedon ranges from 12 to 40 inches. The texture is clay throughout. Weighted average clay content of the control section ranges from 45 to 60 percent. When dry, cracks 0.5 to more than 1 inch wide, extend from the surface to a depth of 12 inches or more. Cracks remain open for less than 60 cumulative days in most years. Slickensides and wedge-shaped peds begin at a depth ranging from 10 to 24 inches. Undisturbed areas have gilgai microrelief with microhighs 6 to 15 inches higher than the microlow. Distance from the center of the microhigh to the center of the microlows ranges from 3 to 12 feet. Some pedons have a few gypsum crystals below a depth of 50 inches.

Microhighs make up 5 to 25 percent of the pedon. Typically, colors in the microhigh have value of 4 or more. Calcium carbonate concretions, mainly in clusters, range from 1 to 5 percent in the lower part of the microhigh in some pedons.

The A horizon has hue of 10YR to 5Y, value of 3, and chroma of 1. In rice culture, Ap horizons 4 to 6 inches thick include value that ranges to 4. Redoximorphic features range from none to few in shades of brown or gray and are developed by rice culture. Reaction is extremely acid or very strongly acid.

The Bss horizon has hue of 10YR to 5Y, value of 3 or 4, and chroma of 2 or less. Iron concentrations range from few to common with colors in shades of brown or yellow. Some pedons contain a few iron features in shades of red or gray. Iron features in the upper part are developed or enhanced by rice culture. Reaction is very strongly acid or strongly acid.

The Bssg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. Iron concentrations range from few to many in shades of red, yellow, or brown. Some pedons have a few iron depletions with colors in shades of gray. Microhighs commonly have a few calcium carbonate nodules or concretions below a depth of 40 inches. Reaction ranges from strongly acid to slightly alkaline.

Leerco Series

The Leerco series consists of very deep, very poorly drained, very slowly permeable soils that formed in unconsolidated clayey sediments. These soils are in broad marshes. Slopes are 0 to 1 percent. The soils of the Leerco series are fine, smectitic, nonacid, hyperthermic Typic Hydraquents.

Typical pedon of Leerco muck, 0 to 1 percent slopes, frequently flooded, tidal; Jefferson County, Texas; from the intersection of Texas Highway 87 and Farm Road 3322 in Sabine Pass, 12 miles west on Texas Highway 87 to McFaddin National Wildlife Refuge, 5.0 miles northwest on refuge road to Intracoastal Waterway, 3.0 miles southwest on road along Intracoastal Waterway, 0.35 mile south on levee and 100 feet east in marsh. (lat. 29 degrees 41 minutes 03 seconds N. and long. 94 degrees 09 minutes 18 seconds W.)

Oe—0 to 5 inches; black (10YR 2/1) muck, about 30 percent fiber, about 20 percent rubbed; about 20 percent mineral matter; massive; fluid; many fine to coarse roots; very slightly saline; moderately acid; clear smooth boundary.

Ag—5 to 14 inches; very dark gray (2.5Y 3/1) mucky clay; massive; slightly fluid, flows with difficulty between fingers when squeezed leaving small residue (n value of 0.7 to 1.0); common fine roots; slightly saline; moderately acid; gradual smooth boundary.

Cg1—14 to 26 inches; gray (2.5Y 5/1) clay; massive; slightly fluid, flows with difficulty between fingers when squeezed leaving small residue (n value of 0.7 to 1.0); common strata of dark gray (10YR 4/1) mucky clay 1 to 2 centimeters thick; common medium dark gray (2.5Y 4/1) masses with diffuse boundaries; few fine iron-manganese concretions; slightly saline; moderately acid; gradual smooth boundary.

Cg2—26 to 34 inches; gray (2.5Y 5/1) clay; massive; slightly fluid, flows with difficulty between fingers when squeezed leaving small residue (n value of 0.7 to 1.0); common strata of very dark gray (2.5Y 3/1) mucky clay 1 to 2 centimeters thick; common medium faint dark gray (2.5Y 4/1) masses with diffuse boundaries; common medium prominent yellowish brown (10YR 5/4) iron concentrations; few fine iron-manganese concretions; moderately saline; strongly acid; gradual smooth boundary.

Cg3—34 to 80 inches; gray (2.5Y 6/1) clay; massive; very fluid, flows easily between fingers when squeezed leaving small residue (n value of 1.0 to 1.5); few strata of very dark gray (2.5Y 3/1) mucky clay 1 centimeters thick; common medium faint dark gray (2.5Y 4/1) and gray (2.5Y 5/1) masses with diffuse boundaries; common fine distinct black (2.5Y 2.5/1) iron-manganese concentrations; moderately saline; moderately acid.

The soils are saturated with slightly brackish water most of the year. N value ranges from 0.7 to 1.0 within 8 inches of the surface. Depth to n value that ranges from 1.0 to 2.0 is from 20 to 40 inches and extends to more than 80 inches. Electrical conductivity of the upper 10 inches is less than 4 dS/m and ranges from 4 to 12 dS/m in the lower part of the pedon. The particle-size control section contains 40 to 60 percent clay.

The Oe horizon has hue of 10YR to 5Y, or N, value of 2 to 5, and chroma of 1 or less. Texture is muck, peat, or mucky peat. Reaction ranges from moderately acid to neutral.

The A horizon with hue of 10YR to 5Y, or N, value of 2 to 4, and chroma of 1 or less. Texture is silty clay, clay, or mucky clay. Reaction ranges from moderately acid to slightly alkaline.

The Cg horizons have hue of 10YR to 5BG, or N, value of 3 to 6, and chroma of 1 or less. Most pedons have few to common strata of muck or mucky clay, 5 millimeters to 3 centimeters thick, with hue 10YR to 5Y, value 2 or 3, and chroma 1. Redoximorphic features, mainly iron-manganese and iron concentrations, are in shades of black, brown, and gray. Texture is silty clay or clay. Reaction ranges from moderately acid to slightly alkaline.

Leton Series

The Leton series consists of very deep, poorly drained, slowly permeable soils that formed in thick loamy sediments. These soils are in relict stream depressions on prairies. Slopes are 0 to 1 percent, but typically less than 1 percent. The soils of the Leton series are fine-silty, siliceous, superactive, hyperthermic Typic Glossaqualfs.

Typical pedon of Leton loam, ponded, 0 to 1 percent slopes; from the intersection of Texas Highway 73 and Farm Road 124 near Hampshire, 7.0 miles east on Texas Highway 73, 4.2 miles south and east on county road, 4.5 miles east on county and private road and 100 feet south of road. (lat. 29 degrees 45 minutes 16 seconds N. and Latitude 94 degrees 08 minutes 40 seconds W.)

A1—0 to 4 inches; dark grayish brown (10YR 4/2) loam; weak medium subangular blocky structure; friable, firm, slightly sticky, slightly plastic; common fine and medium roots; extremely acid; clear smooth boundary.

A2—4 to 8 inches; dark gray (10YR 4/1) loam; weak medium subangular blocky structure; friable, firm, slightly sticky, slightly plastic; few fine roots; extremely acid; clear smooth boundary.

A3—8 to 20 inches; dark gray (10YR 4/1) loam; weak medium subangular blocky structure; friable, firm, slightly sticky, slightly plastic; common fine faint gray (10YR 5/1) iron depletions; ultra acid; gradual smooth boundary.

Bt/E—20 to 34 inches; gray (10YR 5/1) silty clay loam; 20 percent fine and medium gray (10YR 6/1) iron depletions of E material as streaks and pockets; weak medium subangular blocky structure; friable, firm, slightly sticky, slightly plastic; ultra acid; gradual smooth boundary.

Btg1—34 to 52 inches; gray (10YR 6/1) silty clay loam; weak medium subangular blocky structure; friable, firm, slightly sticky, slightly plastic; common fine distinct yellowish brown (10YR 5/4) iron concentrations; few fine faint gray (10YR 5/1) iron depletions; extremely acid; gradual smooth boundary.

Btg2—52 to 80 inches; gray (10YR 6/1) silty clay loam; weak medium subangular blocky structure; friable, firm, slightly sticky, slightly plastic; common fine distinct yellowish brown (10YR 5/4); common fine to medium iron-manganese concretions; few fine faint gray (10YR 5/1) iron depletions; extremely acid; gradual smooth boundary.

The thickness of the solum is more than 80 inches. The soil has more than 10 percent sand throughout the solum of which nearly all is very fine. The A (and E horizons, where present), range from 10 to 30 inches thick. Reaction ranges from strongly acid to neutral in the A and E horizons, extremely acid to slightly alkaline in the B/E horizons and ultra acid to slightly alkaline in the Btg horizon.

The A or Ap horizon has hue of 10YR, value of 4 through 6, and chroma of 1 or 2.

The E horizon, where present, has hue of 10YR, value of 4 to 7, and chroma of 1 or 2. Texture is silt loam, loam, or very fine sandy loam. Redoximorphic features range from none to common in shades of brown or gray. Brown organic stains are present in many pedons. Many pedons have few albic materials as uncoated sand grains less than 0.5 millimeters wide.

The Bt/E horizon is silt loam, loam, or very fine sandy loam in the E part and loam, sandy clay loam, clay loam, or silty clay loam in the B part. Weighted average clay content of the upper 20 inches is 18 to 35 percent, with less than 15 percent fine and coarse sand. The E part occurs as albic material that penetrates the Bt to a depth of 35 inches and makes up 15 to 40 percent of the horizon. The Bt has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. The E part has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. Redoximorphic features range from few to common and are in shades of brown and gray.

The Btg horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. Texture is loam, sandy clay loam, clay loam, silty clay loam, or clay. Redoximorphic features range from few to common in shades of yellow, brown, or gray.

Levac Series

The Levac series consists of very deep, somewhat poorly drained, very slowly permeable soils that formed in silty and clayey sediments. These soils are on small circular areas that have been leveled on broad prairies. Slopes are 0 to 1 percent. The soils of the Levac series are fine, smectitic, hyperthermic Oxyaquic Vertic Hapludalfs.

Typical pedon of Levac silt loam, in an area of Morey-Levac complex, 0 to 1 percent slopes; Jefferson County, Texas; from the intersection of Texas Highway 73 and 124 southwest of Hampshire, 11.9 miles east on Texas Highway 73, 0.9 mile south on private road, 0.15 mile east on field road and 500 feet north in cropland. (long. 94 degrees 09 minutes 30 seconds N. and Latitude 29 degrees 49 minutes 50 seconds W.)

Ap—0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam; weak fine subangular structure; hard, friable; many fine roots; few dark reddish brown (5YR 3/4) iron concentrations along root channels; neutral; abrupt smooth boundary.

Bt—5 to 18 inches; grayish brown (10YR 5/2) silty clay loam; weak fine subangular blocky structure; hard, friable; common fine and few medium roots; few fine pores; few faint clay films; few dark reddish brown (5YR 3/4) iron concentrations along root channels; few iron-manganese concretions; moderately alkaline; gradual wavy boundary.

Btssg—18 to 34 inches; light brownish gray (10YR 6/2) clay; moderate medium prismatic structure parting to moderate fine subangular blocky; very hard, very firm; few fine roots; few fine pores; few distinct slickensides; few faint clay films; common medium distinct yellowish brown (10YR 5/6) and yellowish red (5YR 5/6) iron concentrations; few very dark gray (10YR 3/1) krotovinas; few very coarse concretions of calcium carbonate; very slightly effervescent; moderately alkaline; gradual wavy boundary.

Btkg—34 to 52 inches; light brownish gray (10YR 6/2) silty clay; moderate medium prismatic structure parting to moderate fine subangular blocky; very hard, very firm; few fine roots; few fine pores; few faint clay films; common medium distinct yellowish brown (10YR 5/6) iron concentrations; few very dark gray (10YR 3/1) krotovinas; 15 to 20 percent coarse and very coarse concretions of calcium carbonate; strongly effervescent; moderately alkaline; gradual wavy boundary.

Btg—52 to 80 inches; light brownish gray (10YR 6/2) silty clay; moderate medium prismatic structure parting to moderate fine subangular blocky; very hard, very firm; few faint clay films; common medium distinct yellowish brown (10YR 5/6) and yellowish red (5YR 5/6) iron concentrations; few coarse concretions of calcium carbonate; strongly effervescent; moderately alkaline.

The thickness of the solum is more than 80 inches. Weighted average clay content of the particle-size control section ranges from 35 to 45 percent. Depth to carbonates and depth to matrix that effervesces ranges from 10 to 30 inches. The soil is usually moist, but during the summer of some years cracks 0.5 to 1 inch wide extend to a depth of more than 20 inches. Depth to wedge-shaped peds and slickensides ranges from 15 to 25 inches. Linear extensibility ranges from 6.0 to 8.0 centimeters in the upper 40 inches of the soil. The surface layers are saturated 30 to 40 days mainly during late winter and early spring. Combined thickness of the Ap and E horizon ranges from 4 to 7 inches. Redoximorphic features are considered both contemporary and relict. This soil does not have aquic conditions in most years in the upper 40 inches. SAR ranges from 4 to 13 throughout the pedon.

The Ap horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 1 or 2. Texture is loam or silt loam. Reaction ranges from slightly acid to slightly alkaline.

The E horizon, where present, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. Texture is loam or silt loam. Iron concentrations range from few to many in shades of red, yellow, and brown. Reaction ranges from slightly acid to slightly alkaline.

The Bt horizon has hue 10YR to 5Y, value of 4 or 5, and chroma of 1 or 2. Texture is silt loam or silty clay loam. Iron concentrations range from few to many in shades of red, yellow, and brown. Reaction ranges from neutral to moderately alkaline.

The Btssg horizon has hue 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2. Texture is silty clay or clay. Iron concentrations range from few to many in shades of red, yellow, and brown. Reaction ranges from neutral to moderately alkaline.

The Btkg and Btg horizons have hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. Texture is silty clay or clay. Iron concentrations range from few to many in shades of red, yellow, and brown. Reaction ranges from neutral to moderately alkaline. Calcium carbonate concretions range from coarse to extremely coarse and are up to 4 or 5 inches in length and 2 inches in diameter.

Meaton Series

The Meaton series consists of very deep, somewhat poorly drained, slowly permeable soils that formed in loamy and clayey sediments. These soils are on broad prairies. Slopes are 0 to 1 percent. The soils of the Meaton series are fine-silty, siliceous, superactive, hyperthermic Typic Argiaquolls.

Typical pedon of Meaton silt loam in an area of Meaton-Spindletop complex, 0 to 1 percent slopes, occasionally flooded, tidal; Jefferson County, Texas; from the intersection of Texas Highway 73 and 124 southwest of Hampshire, 7.0 miles east on Texas Highway 73, 3.5 miles south on Big Hill Road, 2 miles east on Needmore Road, 2.75 miles east on ranch road to ranch headquarters, 1.3 miles south on ranch road and 200 feet east in rangeland. (lat. 29 degrees 44 minutes 16 seconds N. and long. 94 degrees 09 minutes 33 seconds W.)

A1—0 to 3 inches; very dark gray (10YR 3/1) silt loam; weak medium granular structure; hard, friable; slightly sticky, slightly plastic; many fine roots; many fine pores; few fine faint brown (7.5YR 4/4) iron concentrations in root channels; few light gray (10YR 7/2) iron depletions; moderately acid; gradual smooth boundary.

A2—3 to 12 inches; very dark gray (10YR 3/1) silt loam; weak medium subangular blocky structure; hard, friable; slightly sticky, slightly plastic; many fine roots; many fine pores; few fine faint brown (7.5YR 4/4) iron concentrations in root channels; common light gray (10YR 7/2) iron depletions; moderately acid; gradual smooth boundary.

Bt—12 to 22 inches; very dark gray (10YR 3/1) silty clay loam; moderate medium prismatic structure parting to weak medium subangular blocky; hard, friable; sticky, plastic; many fine roots; many fine pores; few fine faint yellowish brown

(10YR 5/8) iron concentrations; common light gray (10YR 7/2) iron depletions; common distinct clay films; moderately acid; gradual smooth boundary.

Btg1—22 to 31 inches; dark gray (10YR 4/1) silty clay loam; moderate medium prismatic structure parting to weak medium subangular blocky; hard, friable; sticky, plastic; many fine roots; many fine pores; common fine faint dark yellowish brown (10YR 4/4) iron concentrations; common gray (10YR 5/1) iron depletions mainly on ped faces; common distinct clay films; neutral; gradual smooth boundary.

Btg2—31 to 37 inches; gray (10YR 5/1) silty clay loam; moderate medium prismatic structure parting to moderate fine angular blocky; hard, firm; few fine roots; very few fine pores; common medium distinct light yellowish brown (10YR 6/4) and strong brown (7.5YR 5/6) iron concentrations; few fine soft rounded iron-manganese concretions; common distinct dark gray (10YR 4/1) clay films; common dark gray (10YR 4/1) crawfish krotovina; neutral; gradual smooth boundary.

Btg3—37 to 63 inches; gray (10YR 6/1) silty clay loam; moderate medium prismatic structure parting to moderate fine angular blocky; hard, firm; few fine roots; very few fine pores; few small pressure faces; few distinct clay films; few medium distinct brownish yellow (10YR 6/6) iron concentrations; few pitted concretions of calcium carbonate; few very dark gray (10YR 3/1) krotovinas; slightly alkaline; gradual wavy boundary.

Btg4—63 to 76 inches; gray (10YR 6/1) silty clay loam; moderate medium prismatic structure parting to moderate fine angular blocky; hard, firm; few fine roots; few distinct clay films; few medium distinct brownish yellow (10YR 6/6) iron concentrations; common greenish gray (5GY 6/1) iron depletions; few pitted calcium carbonate concretions; slightly alkaline; gradual wavy boundary.

Btg5—76 to 80 inches; light brownish gray (2.5Y 6/2) silty clay; weak fine subangular blocky structure; very hard, very firm; few distinct clay films; common medium distinct brownish yellow (10YR 6/6) iron concentrations; few iron-manganese stains and concentrations; few pitted calcium carbonate concretions; slightly alkaline; gradual wavy boundary.

The thickness of the solum is more than 80 inches. The upper 20 inches of the Bt has 25 to 34 percent weighted-clay average. The mollic epipedon is 10 to 25 inches thick. Depth to concretions of calcium carbonate is more than 24 inches. These soils have aquic conditions in most years.

The A horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 or 2. Texture is loam or silt loam. Iron concentrations in shades of yellow and brown range from few to many. Reaction is moderately acid to neutral. SAR ranges from 2 to 6.

The Bt horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 or 2. Texture is silt loam, silty clay loam, or clay loam. Iron concentrations in shades of red, yellow, and brown range from few to many. Iron depletions in shades of gray range from few to many. Reaction ranges from moderately acid to slightly alkaline. SAR ranges from 4 to 13.

The Btg1, Btg2, Btg3, and Btg4 horizons have hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2. Texture is clay loam or silty clay loam. Iron concentrations in shades of yellow and brown range from few to many. Iron depletions in shades of gray range from few to common. Concretions of calcium carbonate range from few to common. Reaction ranges from neutral to moderately alkaline. SAR ranges from 4 to 13.

The Btg5 horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. Texture is clay or silty clay. Iron concentrations in shades of red, yellow, and brown range from few to many. Iron depletions in shades of gray range from few to common. Concretions of calcium carbonate range from few to common. Reaction is slightly alkaline or moderately alkaline. SAR ranges from 4 to 13.

Mollco Series

The Mollco series consists of very deep, very poorly drained, moderately slowly permeable soils that formed in loamy sediments. These soils are in depressional forested areas. Slopes are 0 to 1 percent, but typically less than 1 percent. The soils of the Mollco series are fine-loamy, siliceous, superactive, thermic Typic Glossaqualfs.

Typical pedon of Mollco fine sandy loam, ponded, 0 to 1 percent slopes; Jefferson County, Texas; from the intersection of Farm Road 365 and Interstate Highway 10 about 14 miles southwest of Beaumont, 2.0 miles west on Farm Road 365, 2.0 miles north on private road and 100 feet east of road in forest. (lat. 29 degrees 57 minutes 20 seconds N. and long. 94 degrees 17 minutes 39 seconds W.)

A—0 to 3 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak medium granular structure; loose, nonsticky, nonplastic; many fine roots; 0.5 inch of leaf litter on surface; very strongly acid; clear smooth boundary.

Eg1—3 to 10 inches; gray (5Y 6/1) fine sandy loam; weak medium granular structure; soft, very friable, nonsticky, nonplastic; few fine roots; prominent strong brown (7.5YR 5/6) iron concentrations along root channels; extremely acid; clear smooth boundary.

Eg2—10 to 16 inches; gray (5Y 6/1) fine sandy loam; weak medium granular structure; soft, very friable, nonsticky, nonplastic; few fine roots; extremely acid; clear smooth boundary.

Btg/E1—16 to 22 inches; gray (5Y 6/1) sandy clay loam; weak coarse prismatic structure parting to weak medium subangular blocky; friable, firm, slightly sticky, slightly plastic; common fine distinct light gray (N 7/) iron depletions on faces of peds; about 15 percent gray (5Y 6/1) albic material (E); extremely acid; gradual smooth boundary.

Btg/E2—22 to 38 inches; greenish gray (5BG 6/1) sandy clay loam, gray (5Y 6/1) upon exposure to air; moderate coarse prismatic structure parting to weak fine angular blocky; friable, firm, slightly sticky, slightly plastic; common fine and medium prominent strong brown (7.5YR 5/6) iron concentrations inside peds; about 20 percent greenish gray (5BG 6/1) albic materials (E), gray (5Y 6/1) upon exposure to air; extremely acid; gradual smooth boundary.

Btg/E3—38 to 62 inches; gray (5Y 6/1) sandy clay loam; moderate coarse prismatic structure parting to weak fine angular blocky; friable, firm, slightly sticky, slightly plastic; common fine and medium prominent strong brown (7.5YR 5/6) iron concentrations inside peds; about 35 percent gray (5Y 6/1) albic materials (E); extremely acid; gradual smooth boundary.

Btg/E4—62 to 80 inches; gray (5Y 6/1) sandy clay loam; moderate coarse prismatic structure parting to weak fine angular blocky; friable, firm, slightly sticky, slightly plastic; common fine and medium prominent brown (7.5YR 5/4) iron concentrations inside peds; about 40 percent gray (5Y 6/1) albic materials (E); extremely acid.

The thickness of the solum is more than 80 inches. The weighted average clay content of the particle-size control section ranges from 18 to 30 percent.

The A horizon has neutral colors with value of 3 to 5 or has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 1 or 2. Redoximorphic features range from none to common in shades of brown or gray. Reaction ranges from extremely acid to strongly acid.

The Eg horizon has neutral colors with value of 4 to 7 or has colors with hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 to 2. Redoximorphic features range from none to common in shades of brown or gray. Reaction ranges from extremely acid to strongly acid.

The upper part of the Btg/E horizon has neutral colors with value of 5 to 7 or has colors with hue of 10YR to 5Y, or 5BG, value of 5 to 7, and chroma of 1 or 2. Texture is loam or sandy clay loam. Albic, or E material in the form of streaks, coatings, or masses make up 15 to 40 percent of the control section. They have neutral color with value of 6 or 7 or have hue of 10YR to 5Y, 5BG, and 5G, value 6 or 7, and chroma of 1. Redoximorphic features range from few to common in and are in shades of yellow, brown, or gray. Reaction ranges from extremely acid to slightly acid.

The middle and lower part of the Btg/E horizon have neutral color with value 5 to 7 or have hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Texture is loam, sandy clay loam, or clay loam. Albic materials make up 20 to 45 percent. Redoximorphic features range from few to common in shades of yellow, brown, or gray. Reaction ranges from extremely acid to slightly acid.

Morey Series

The Morey series consists of very deep, somewhat poorly drained, slowly permeable soils that formed in loamy sediments. These soils are on prairies. Slopes are 0 to 1 percent. The soils of the Morey series are fine-silty, siliceous, superactive, hyperthermic Oxyaquic Argiudolls.

Typical pedon of Morey loam in Morey-Levac complex, 0 to 1 percent slopes; Jefferson County, Texas; 10.75 miles west of Beaumont on U.S. Highway 90 from its intersection with Interstate Highway 10, 1.0 mile north to Texas Agricultural Experiment Station, and 0.35 miles west of Headquarters Building in cropland. (lat. 30 degrees 04 minutes 01 seconds N. and long. 94 degrees 18 minutes 02 seconds W.)

Ap—0 to 5 inches; very dark gray (10YR 3/1) loam; moderate medium granular structure; hard, friable; many fine roots; neutral; abrupt smooth boundary.

Bt1—5 to 9 inches; very dark gray (10YR 3/1) loam; moderate coarse angular blocky structure; hard, firm; common fine and few medium roots; few distinct brown (10YR 5/3) iron concentrations; few fine rounded iron-manganese concretions; neutral; gradual smooth boundary.

Bt2—9 to 16 inches; very dark gray (10YR 3/1) clay loam; moderate medium prismatic structure parting to moderate fine angular blocky structure; very hard, very firm; few fine and few medium roots; neutral; few distinct brown (10YR 5/3) iron concentrations; few faint grayish brown (10YR 5/2) iron depletions; slightly alkaline; gradual smooth boundary.

Bt3—16 to 26 inches; very dark gray (10YR 3/1) clay loam; moderate medium prismatic structure parting to moderate fine angular blocky structure; very hard, very firm; few fine roots in cracks; few medium distinct yellowish brown (10YR 5/4) iron concentrations; few fine rounded iron-manganese concretions; slightly alkaline; gradual smooth boundary.

Bt4—26 to 36 inches; dark gray (10YR 4/1) clay loam; moderate medium prismatic structure parting to moderate fine angular blocky structure; very hard, very firm; few very fine roots in cracks; few fine prominent dark yellowish brown (10YR 4/6) and brownish yellow (10YR 6/8) iron concentrations; few rounded iron-manganese concretions; few coarse rounded concretions of calcium carbonate; moderately alkaline; gradual wavy boundary.

Btg1—36 to 49 inches; dark gray (10YR 4/1) clay loam; moderate coarse prismatic structure parting to strong fine angular blocky structure; very hard, very firm; few very fine roots in cracks; common prominent light yellowish brown (10YR 6/4) iron concentrations; common medium faint gray (10YR 5/1) iron depletions; few iron-manganese concretions; few medium rounded concretions of calcium carbonate; moderately alkaline; gradual wavy boundary.

Btg2—49 to 55 inches; grayish brown (10YR 5/2) and gray (10YR 5/1) clay loam; moderate coarse prismatic structure parting to moderate medium angular blocky structure; very hard, very firm; few very fine roots in cracks; common medium distinct light yellowish brown (10YR 5/6) and brownish yellow (10YR 6/6) iron concentrations; few iron-manganese concretions; few coarse rounded concretions of calcium carbonate; moderately alkaline; clear wavy boundary.

Btkg—55 to 80 inches; light brownish gray (2.5Y 6/2) clay loam; moderate coarse prismatic structure parting to weak medium angular blocky structure; hard, firm; common medium prominent brownish yellow (10YR 6/6) iron concentrations; few coarse rounded concretions of calcium carbonate; strongly effervescent; moderately alkaline; clear wavy boundary.

The thickness of the solum is more than 80 inches. The mollic epipedon is 10 to 30 inches thick. Combined thickness of the Ap or A horizon ranges from 5 to 15 inches. Clay content of the particle-size control section ranges from 22 to 35 percent, silt 30 to 50 percent, and sand 15 to 35 percent of which there is less than 15 percent fine sand or coarser. Depth to carbonates is more than 24 inches and depth to matrix that effervesces is more than 30 inches. SAR ranges from 2 to 6 in the upper 20 inches and 4 to 8 below 20 inches.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 or 2. Texture is loam, silt loam, or silty clay loam. Iron concentrations in shades of yellow and brown range from few to common. Irrigation for rice production, on a 3- to 5-year rotation, ponds these soils for 2 to 5 months. During this period iron concentrations and iron depletions range from common to many in shades of red, yellow, brown, gray, and green.

These temporary redoximorphic features persist for about 1 to 3 years following rice production. Reaction ranges from strongly acid to neutral.

The Bt horizons have hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 1 or 2. Texture is loam, silt loam, clay loam, or silty clay loam. Iron concentrations in shades of red, yellow, and brown range from few to many. Reaction ranges from slightly acid to moderately alkaline.

The Btg horizons have hue of 10YR to 5Y, value of 4 or 5, and chroma of 1 or 2. Texture is clay loam, silty clay loam, clay, or silty clay. Iron concentrations in shades of red, yellow, and brown range from few to many. Reaction is neutral to moderately alkaline.

The Btkg horizon, present in most pedons, has hue of 10YR to 5Y, value of 4 or 5, and chroma of 1 or 2. Texture is clay loam, silty clay loam, clay, or silty clay. Iron concentrations in shades of red, yellow, or brown range from few to many. Calcium carbonate concretions range from 1 to 5 percent and effervescence ranges from very slight to strong. Reaction is slightly alkaline or moderately alkaline.

Neches Series

The Neches series consists of very deep, well drained, slowly permeable soils that formed in sandy and loamy sediments dredged from rivers and creeks. These soils are on prairies. Slope ranges from 2 to 5 percent. The soils of the Neches series are coarse-loamy, siliceous, active, nonacid, hyperthermic Typic Udorthents.

Typical pedon of Neches coarse sand, 2 to 5 percent slopes; Orange County, Texas; from the intersection of Interstate Highway 10 and U.S. Highway 69 in Beaumont, 3.8 miles east on Interstate Highway 10 to Old Highway exit, 0.3 mile south on Old Highway to levee road, 1.25 miles southeast and 0.6 mile west on levee road to pipeline, 0.2 mile northwest along pipeline and 200 feet south of pipeline in pasture. (lat. 30 degrees 04 minutes 46 seconds N. and long. 94 degrees 03 minutes 49 seconds W.)

A—0 to 5 inches; brown (10YR 4/3) coarse sand; single grain; loose, very friable; many fine and few coarse roots; slightly acid; abrupt smooth boundary.

C1—5 to 18 inches; brown (10YR 5/3) coarse sand; single grain; loose, very friable; many fine and few medium roots; few fine pores; few discontinuous 1- to 3-inch thick strata of gray (10YR 6/1) clay; few rounded masses of dark gray (10YR 4/1) clay 0.25 to 0.5 inch in size; few shell fragments; slightly acid; abrupt smooth boundary.

C2—18 to 36 inches; yellowish brown (10YR 5/4) coarse sand; single grain; loose, very friable; common fine and few medium roots; few fine pores; few yellowish brown (10YR 5/6) iron concentrations in pores; few discontinuous 1- to 3-inch thick strata and few rounded masses of gray (10YR 6/1) clay 0.25 to 3 inches in size; 2 to 5 percent shell fragments; neutral; abrupt smooth boundary.

C3—36 to 41 inches; pale brown (10YR 6/3) coarse sand; single grain; loose, very friable; common fine roots; few fine pores; few strata 0.25 to 2 inches thick of light yellowish brown (10YR 6/4) fine sandy loam; few discontinuous 1- to 3-inch thick strata and common rounded masses of gray (10YR 6/1) clay 0.25 to 3 inches in size; 2 to 5 percent shell fragments; neutral; abrupt smooth boundary.

Cg—41 to 45 inches; gray (10YR 6/1) clay; weak medium platy structure; very hard, very firm; few fine roots; few prominent yellowish red (5YR 5/8) iron concentrations; few strata 0.25 to 0.5 inch thick of pale brown (10YR 6/3) coarse sand; few shell fragments; neutral; abrupt smooth boundary.

C—45 to 54 inches; pale brown (10YR 6/3) coarse sand; single grain; loose, very friable; few fine roots; few strata 0.5 to 2 inches thick of light yellowish brown (10YR 6/4) coarse sand; few rounded masses of gray (10YR 6/1) clay with common prominent yellowish red (5YR 5/8) iron concentrations; 2 to 5 percent shell fragments; neutral; abrupt smooth boundary.

Cg'—54 to 80 inches; light brownish gray (2.5Y 6/2) clay; weak medium platy structure; very hard, very firm; few thin strata up to 0.25 inch thick of light olive brown (2.5Y 5/4) and yellowish brown (10YR 5/4) coarse sand in the upper part; neutral.

Rooting depth is more than 80 inches. Dredging or dragline operations have mixed the materials, which have been randomly deposited near river or stream channels. These soils are forming in sandy materials stratified with loamy and clayey materials. The weighted average clay content of the control section ranges from 3 to 18 percent. The weighted average sand content of the control section is 60 to 80 percent with more than 30 percent coarse sand. The soil contains 1 to 5 percent shell fragments in some layer in most pedons. Rounded siliceous pebbles range up to 10 percent of some pedons.

The A horizon has hue of 10YR, value of 3 to 6, and chroma of 2 to 4. Pedons that have color value of 3 and chroma 2 or 3 are less than 6 inches thick. Texture is variable and mixed, but dominant texture is coarse sand or loamy sand. Most pedons have thin strata of rounded masses of clay or thin layers of clay with similar colors as the matrix. Some pedons have few to common iron concentrations in shades of yellow or brown. Reaction ranges from moderately acid to neutral.

The C horizons have hue of 10YR, value of 5 to 8, and chroma of 3 or 4. Textures are variable and mixed, but dominant texture is coarse sand or loamy sand. The C horizon has up to 15 percent by volume rounded masses of clay oriented into layers 0.5 to 2 inches thick or as individual rounded masses of clay 0.25 to 4 inches in size. The clay is coated with iron concentrations in shades of red, yellow, or brown. Iron concentrations in the matrix are few to common in shades of red, yellow, or brown. Reaction ranges from moderately acid to neutral.

The Cg horizons, where present, have hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. Texture is loam, clay loam, or clay. Iron concentrations are in shades of red, yellow, or brown. Some pedons have a few iron-manganese masses or concretions. The matrix color and iron concentrations are relict iron features. Reaction ranges from moderately acid to neutral.

Neel Series

The Neel series consists of very deep, moderately well drained, very slowly permeable clayey soils that formed in clayey deposits dredged from bays and marshes. These soils are on ridges. Slope ranges from 2 to 5 percent. The soils of the Neel series are fine, smectitic, nonacid, hyperthermic Mollic Udarents.

Typical pedon of Neel clay, 2 to 5 percent slopes, occasionally flooded, tidal; Jefferson County, Texas; from the intersection of Farm Road 3322 and U.S. Highway 67 in Sabine Pass, 11.8 miles west on U.S. Highway 67, 5.1 miles north-northwest on private shell road to Gulf Intracoastal Waterway, 0.5 mile northeast on trail along spoil bank and 25 feet north on spoil bank. (lat. 29 degrees 43 minutes 12 seconds N. and long. 94 degrees 06 minutes 48 seconds W.)

A—0 to 12 inches; light brownish gray (2.5Y 6/2) clay; weak medium and coarse angular blocky structure; extremely hard, extremely firm; common fine and very fine roots; many medium distinct light olive brown (2.5Y 5/6), common coarse olive yellow (2.5Y 6/8), red (2.5YR 4/6), and very dark gray (2.5Y 3/1) spots; few oyster shells on surface; neutral; gradual smooth boundary.

C1—12 to 40 inches; gray (5Y 6/1) clay; massive; extremely hard, extremely firm; common fine and very fine roots; many medium distinct olive (5Y 5/6), common coarse light olive brown (2.5Y 5/4), and red (2.5YR 4/6) spots; common coarse very dark gray (2.5Y 3/1) masses, and common very pale brown (10YR 7/3) masses of loamy material; moderately saline; slightly alkaline; gradual smooth boundary.

C2—40 to 80 inches; light gray (5Y 7/1) clay; massive; extremely hard, extremely firm; few fine roots; few spots of calcareous material less than 4 inches in diameter; many medium distinct coarse light olive brown (2.5Y 5/6) spots, common streaks and discontinuous layers of very dark gray (2.5Y 3/1), and common very pale brown (10YR 7/3) masses of loamy material; very slightly saline; slightly alkaline.

Soil materials are more than 80 inches thick. Dredging or dragline operations have mixed the materials that have been randomly deposited into a layer that ranges from 6 to 20 feet thick. Typically 85 percent or more of the mass is clayey material with occasional masses of loamy material. The weighted average clay content of the control section is 40 to 55 percent. Relict iron-manganese and pitted concretions of calcium carbonate range from none to common. When dry, cracks 1 to 2 inches wide at the surface extend into the C horizon but remain open for less than 90 cumulative days. Reaction ranges from slightly acid to slightly alkaline. Less than 15 percent of the mass is calcareous. Electrical conductivity ranges from 0 to 8 dS/m in the surface layer and from 2 to 12 dS/m in the lower layers.

This soil has hue of 10YR to 5Y, and N, value of 4 to 7, chroma of 1 or 2. Masses, layers, streaks, or spots in shades of red, yellow, and brown range from few to many. Relict mollic epipedon materials and cambic materials are throughout the soil.

Orcadia Series

The Orcadia series consists of very deep, somewhat poorly drained, very slowly permeable soils that formed in loamy and clayey sediments. These soils are on prairies. Slope ranges from 0 to 2 percent. The soils of the Orcadia series are fine, smectitic, hyperthermic Oxyaquic Glossudalfs.

Typical pedon of Orcadia silt loam, 0 to 2 percent slopes; Orange County, Texas; from the intersection of Texas Highway 73 and Texas Highway 87 and Farm Road 1442 in Bridge City, 2.2 miles east on Farm Road 1442, 1.0 mile south on private road and 400 feet east of road in pasture. (lat. 30 degrees 01 minutes 14 seconds N. and long. 93 degrees 47 minutes 32 seconds W.)

A—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam; weak medium prismatic structure parting to weak fine subangular blocky; slightly hard, firm; many fine and few medium roots; common fine tubular pores; few fine prominent brown (7.5YR 4/4) iron concentrations along root channels; many medium distinct grayish brown (10YR 5/2) iron depletions; very strongly acid; abrupt smooth boundary.

E—5 to 10 inches; grayish brown (10YR 5/2) silt loam; weak medium subangular blocky structure; slightly hard, firm; common fine and medium roots; common fine tubular pores; common fine distinct yellowish brown (10YR 5/4) iron concentrations; few fine prominent strong brown (7.5YR 4/6) iron concentrations along root channels; many medium distinct dark grayish brown (10YR 4/2) depletions; very strongly acid; clear smooth boundary.

Bt/E—10 to 15 inches; dark grayish brown (10YR 4/2) silty clay loam (Bt); moderate medium prismatic structure parting to weak medium subangular blocky; hard, firm; common fine and medium roots along surface of prisms; common fine tubular pores; few patchy yellowish brown (10YR 5/6) stains with clear boundaries on faces of peds; few fine prominent strong brown (7.5YR 4/6) iron concentrations along root channels; 30 percent light brownish gray (10YR 6/2) albic material (E) on surface of prisms; very strongly acid; clear smooth boundary.

Bt—15 to 29 inches; dark gray (10YR 4/1) clay; weak medium prismatic structure parting to strong fine angular blocky; extremely hard, extremely firm; few fine roots along faces of peds; few fine tubular pores; few pressure faces; common fine and medium dark red (2.5YR 3/6) and few fine red (10R 4/6) iron concentrations with sharp boundaries inside peds; very strongly acid; gradual smooth boundary.

Btg—29 to 45 inches; gray (10YR 5/1) clay; weak medium prismatic structure parting to strong fine angular blocky; extremely hard, extremely firm; few fine roots along faces of peds; few fine tubular pores; common pressure faces; common fine and medium dark red (2.5YR 3/6) and few fine red (10R 4/6) iron concentrations with sharp boundaries inside peds; very strongly acid; gradual smooth boundary.

Btssg—45 to 59 inches; gray (10YR 5/1) clay; weak medium prismatic structure parting to strong fine angular blocky; extremely hard, extremely firm; few fine roots along faces of peds; few fine tubular pores; common pressure faces; common prominent slickensides; many fine and medium dark red (2.5YR 3/6) and few fine brownish yellow (10YR 6/6) iron concentrations with sharp boundaries inside peds; strongly acid; gradual smooth boundary.

B'tg1—59 to 70 inches; light brownish gray (10YR 6/2) clay; weak medium prismatic structure parting to strong fine angular blocky; extremely hard, extremely firm; few fine roots along ped faces; few fine tubular pores; few pressure faces; common fine and medium dark red (2.5YR 3/6) and common fine brownish yellow (10YR 6/8) iron concentrations with sharp boundaries inside peds; 5 percent light gray (10YR 7/1) iron depletions between prism faces; strongly acid; gradual smooth boundary.

B'tg2—70 to 80 inches; light brownish gray (10YR 6/2) clay; weak medium prismatic structure parting to moderate fine angular blocky; extremely hard, extremely firm; few fine roots along faces of peds; few fine tubular pores; few pressure faces; common fine and medium yellowish brown (10YR 5/8) and common fine reddish brown (2.5YR 4/4) iron concentrations with sharp boundaries inside peds; 5 percent light gray (10YR 7/1) iron depletions between prism surface; very strongly acid.

The thickness of the solum is more than 80 inches. Weighted average clay content of the particle-size control section is 35 to 50 percent. The surface layer is saturated 30 to 40 days mainly during late winter and early spring. Redoximorphic features are considered both contemporary and relict. This soil does not have aquic conditions in most years. Depth to the glossic horizon ranges from 8 to 15 inches.

The A or Ap horizon has hue of 10YR, value of 4, and chroma of 1 or 2. Iron concentrations range from few to common in shades of yellow or brown. Reaction ranges from extremely acid to strongly acid.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. Iron concentrations range from few to many in shades of yellow or brown. Reaction ranges from extremely acid to strongly acid.

The Bt/E horizon ranges from 3 to 8 inches thick. The Bt part has hue of 10YR, value of 4 or 5, and chroma of 2. The E part, or albic material, has color with hue of 10YR, value of 5 to 7, and chroma of 1 or 2. Texture is silty clay loam, silty clay, or clay. Iron concentrations are in shades of red, yellow, or brown. Reaction ranges from extremely acid to strongly acid.

The Bt, Btg, and Btssg horizons have hue of 10YR, value of 4 to 6, and chroma of 1 or 2. Texture is silty clay or clay. Pressure faces range from few in the Bt and Btg horizon to common or many in the Btssg horizon. Slickensides range from few to common in the Btssg horizon. Iron concentrations range from few to many in shades of red, yellow or brown. Reaction ranges from extremely acid to strongly acid.

The B'tg horizon has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 1 or 2. Texture is silty clay or clay. Iron concentrations range from common to many in shades of red, brown, and yellow. Reaction ranges from extremely acid to strongly acid.

A BC horizon is in some pedons below a depth of 70 inches. The BC horizon has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 2 or 3. Texture is sandy clay loam or clay loam. Iron concentrations range from common to many in shades of red and brown. Reaction is extremely acid or very strongly acid.

Sabine Series

The Sabine series consists of very deep, moderately well drained, rapidly permeable soils that formed in sandy sediments. These soils are on coastal ridges. Slope ranges from 0 to 2 percent. The soils of the Sabine series are sandy, siliceous, hyperthermic Oxyaquic Hapludolls.

Typical pedon of Sabine loamy fine sand in Sabine-Baines complex, 0 to 2 percent slopes, frequently flooded, tidal; Jefferson County, Texas; from Sabine Pass, 2.5 miles southwest on Texas Highway 87 and 150 feet north in pasture. (lat. 29 degrees 42 minutes 24 seconds N. and long. 93 degrees 55 minutes 25 seconds W.)

A1—0 to 7 inches; very dark gray (10YR 3/1) loamy fine sand; weak fine granular structure; soft, very friable; many fine roots; few dark brown (7.5YR 3/4) organic stains along roots; moderately acid; gradual smooth boundary.

A2—7 to 12 inches; very dark grayish brown (10YR 3/2) loamy fine sand; weak fine granular structure; soft, very friable; many fine roots; few dark brown (7.5YR 3/4) organic stains along roots; moderately acid; gradual smooth boundary.

Bw1—12 to 23 inches; brown (10YR 5/3) loamy fine sand, single grain; loose; few fine roots; few medium dark brown (7.5YR 3/4) iron concentrations; moderately acid; gradual smooth boundary.

Bw2—23 to 37 inches; light yellowish brown (10YR 6/4) loamy fine sand, single grain; loose; few fine roots; few medium dark brown (7.5YR 3/4) iron concentrations; many medium faint light brownish gray (10YR 6/2) iron depletions; moderately acid; clear smooth boundary.

Bw3—37 to 57 inches; mixed light yellowish brown (10YR 6/4) and light brownish gray (10YR 6/2) loamy fine sand, single grain; loose; few fine roots; few medium strong brown (7.5YR 5/8) iron concentrations; slightly acid; clear smooth boundary.

Bg—57 to 80 inches; gray (10YR 6/1) loamy fine sand, single grain; loose; common coarse pale brown (10YR 6/3) and yellowish red (5YR 5/8) iron concentrations; neutral.

Depth to loamy or clayey strata exceeds 80 inches. The texture is fine sand or loamy fine sand throughout. The silt plus clay content exceeds 10 percent. Few to common marine shell fragments occur in some pedons below 30 inches. Reaction ranges from moderately acid to moderately alkaline.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 to 3.

The Bw horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4.

The Bg horizon has hue of 10YR or 2.5Y, value of 5 to 7, chroma of 1 or 2.

Scatlake Series

The Scatlake series consists of very deep, very poorly drained, slowly permeable saline soils that formed in unconsolidated clayey sediments that are permanently saturated with water. These soils are in broad marshes. Slopes are 0 to 1 percent, but typically less than 0.5 percent. The soils of the Scatlake series are very-fine, smectitic, nonacid, hyperthermic Sodic Hydraquents.

Typical pedon of Scatlake mucky clay, 0 to 1 percent slopes, very frequently flooded, tidal; Jefferson County, Texas; from the intersection of U.S. Highway 87 and Farm Road 3322 in Sabine Pass, 1.25 miles southeast and east on Farm Road 3322, 1.5 miles southeast on county road adjacent to the Neches River, 0.6 miles southwest along Texas Bayou and 50 feet north of Texas Bayou in wildlife land. (lat. 29 degrees 42 minutes 24.6 seconds N. and long. 93 degrees 52 minutes 6.8 seconds W.)

A—0 to 8 inches; dark gray (5Y 4/1) mucky clay; very fluid, flows easily when squeezed leaving little residue in hand; soft, very friable, sticky, plastic; many fine and medium roots; moderately acid; strongly saline; clear smooth boundary.

Cg1—8 to 16 inches; dark gray (5Y 4/1) clay; very fluid, flows easily when squeezed leaving little residue in hand; soft, very friable, sticky, plastic; common fine roots; neutral; strongly saline; clear smooth boundary.

Cg2—16 to 34 inches; dark gray (5Y 4/1) clay; very fluid, flows easily when squeezed leaving little residue in hand; soft, very friable, sticky, plastic; neutral; strongly saline; clear smooth boundary.

Cg3—34 to 80 inches; gray (5Y 5/1) clay; very fluid, flows easily when squeezed leaving little residue in hand; soft, very friable, sticky, plastic; common fine roots; neutral; strongly saline; clear smooth boundary.

Scatlake soils are continuously saturated with saline water. Soil salinity or electrical conductivity is more than 16 dS/m. The n value of all mineral horizons is 1.0 or more. Extractable sodium averages more than 20 percent in some horizons of the 10- to 40-inch particle-size control section. Some pedons have an organic surface layer 2 to 10 inches thick.

The Oa horizon, where present, has hue of 7.5YR or 10YR, value of 2 to 4, and chroma of 2 or less. Texture is muck or peat.

The A horizon has hue of 10YR to 5BG, or N, value of 2 to 5, and chroma of 2 or less. Texture is clay, mucky clay, or mucky silty clay loam. Reaction ranges from moderately acid to moderately alkaline.

The Cg horizons have hue of 10YR to 5BG, or N, value of 4 to 6, and chroma of 1 or less. Texture is clay that is semifluid. Iron concentrations range from none to few in shades of brown. Some pedons have thin layers of black muck. Reaction ranges from neutral to moderately alkaline.

Spindletop Series

The Spindletop series consists of very deep, moderately well drained, very slowly permeable soils that formed in loamy and clayey sediments. These soils are on circular mounds about 1 to 2 feet high on broad prairies. Slopes are 0 to 1 percent.

The soils of the Spindletop series are fine, smectitic, hyperthermic Oxyaquic Argiudolls.

Typical pedon of Spindletop silt loam in an area of Morey-Spindletop complex, 0 to 1 percent slopes; Jefferson County, Texas; from the intersection of Texas Highway 73 and Texas Highway 124 southwest of Hampshire, 7.0 miles east on Texas Highway 73, 3.5 miles south on Big Hill Road, 1.2 miles east on Needmore Road, 0.6 miles south on field road and 100 feet west on mound in pasture. (lat. 29 degrees 45 minutes 56 seconds N. and long. 94 degrees 12 minutes 29 seconds W.)

A—0 to 12 inches; very dark gray (10YR 3/1) silt loam; weak fine granular structure; slightly hard, friable; many fine and medium roots; common fine pores; strongly acid; clear smooth boundary.

E1—12 to 16 inches; dark grayish brown (10YR 4/2) silt loam; weak fine subangular blocky structure; slightly hard, friable; few fine roots; few fine pores; strongly acid; clear smooth boundary.

E2—16 to 25 inches; grayish brown (10YR 5/2) silt loam; weak medium subangular blocky structure; slightly hard, friable; few fine roots; common fine pores; common medium distinct yellowish brown (10YR 5/6) iron concentrations; slightly acid; gradual wavy boundary.

Bt/E—25 to 29 inches; light brownish gray (10YR 6/2) silty clay loam (Bt); 15 percent light brownish gray (10YR 6/2) albic material (E) on surface of prisms; strong coarse prismatic structure parting to moderate medium angular blocky; hard, firm; few fine roots; common fine medium pores; common medium prominent distinct yellowish brown (10YR 5/6) iron concentrations; neutral; gradual wavy boundary.

Btg1—29 to 39 inches; light brownish gray (10YR 6/2) clay; moderate coarse prismatic structure parting to moderate subangular blocky; very hard, very firm; few fine roots; few fine and medium pores; common distinct dark gray clay films on faces of peds; common medium prominent yellowish brown (10YR 5/6) iron concentrations; few fine iron-manganese concretions; slightly alkaline; gradual wavy boundary.

Btg2—39 to 56 inches; gray (10YR 6/1) clay; moderate coarse prismatic structure parting to moderate subangular blocky; very hard, very firm; few fine roots; few fine and medium pores; common distinct gray (10YR 5/1) clay films on faces of peds; common medium prominent yellowish brown (10YR 5/6) and yellowish red (5YR 5/8) iron concentrations; few medium concretions of calcium carbonate; slightly alkaline; gradual wavy boundary.

Btg3—56 to 80 inches; light gray (10YR 7/1) clay; moderate coarse prismatic structure parting to moderate subangular blocky; very hard, very firm; common medium prominent strong brown (7.5YR 5/8) iron concentrations; few very coarse concretions of calcium carbonate; slightly alkaline.

The thickness of the solum is more than 80 inches. Combined thickness of the silt loam or loam of the A and E horizons ranges from 15 to 30 inches. Clay content of the particle-size control section ranges from 35 to 50 percent with silt content exceeding 30 percent.

The A horizon has hue of 10YR, value of 3, and chroma of 1 to 3. Iron concentrations in shades of brown range from none to common. Reaction ranges from strongly acid to neutral.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 2 or 3. Iron concentrations in shades of red, yellow, or brown range from few to common. Reaction ranges from strongly acid to neutral.

The Bt/E horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. The albic material (E) has hue of 10YR, value 5 to 7, and chroma 1 or 2. Texture is loam, silt loam, or silty clay loam. Iron concentrations in shades of red, yellow, or brown range from common to many. Reaction ranges from slightly acid to slightly alkaline.

The upper part of the Btg horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. Texture is silty clay or clay. Iron concentrations in shades of red, brown, and yellow range from common to many. Reaction ranges from neutral to moderately alkaline.

The lower part of the Btg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Texture is silty clay or clay. Iron concentrations in shades of red, yellow, or brown range from few to many. Concretions of calcium carbonate range from none to about 5 percent. Reaction ranges from neutral to moderately alkaline.

Spurger Series

The Spurger series consists of very deep, moderately well drained, slowly permeable soils that formed in loamy and clayey sediments. These soils are on forested terraces. Slope ranges from 0 to 5 percent. The soils of the Spurger series are fine, smectitic, thermic Albaquultic Hapludalfs.

Typical pedon of Spurger loam, 0 to 2 percent slopes; Orange County; from the intersection of Farm Road 1131 and Texas Highway 105 about 4 miles north of Vidor, 5.3 miles northwest on Farm Road 1131, 0.7 mile north on Farm Road 1131, 1.3 miles generally southeast on private road, 0.2 mile northeast and 50 feet south of road. (lat. 30 degrees 12 minutes 57.6 seconds N. and long. 94 degrees 04 minutes 23.5 seconds W.)

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

E—4 to 8 inches; brown (10YR 5/3) loam; weak fine subangular blocky structure; friable, soft; common fine and medium roots; strongly acid; clear wavy boundary.

Bt1—8 to 16 inches; red (2.5YR 4/6) clay; moderate medium blocky structure; hard, firm; many fine and medium roots; few clay films; common medium distinct reddish brown (5YR 5/4) masses; strongly acid; gradual smooth boundary.

Bt2—16 to 22 inches; mottled reddish brown (5YR 4/4) and reddish gray (5YR 5/2) clay; moderate medium blocky structure; very hard, very firm; common fine and medium roots; thick continuous red clay films; strongly acid; gradual smooth boundary.

Bt3—22 to 40 inches; light brownish gray (10YR 6/2) clay; weak medium prismatic parting to moderate medium blocky structure; very hard, very firm; few fine roots; thick continuous red clay films; common medium prominent dark red (2.5YR 3/6) and strong brown (7.5YR 5/6) masses; strongly acid; gradual smooth boundary.

Bt4—40 to 50 inches; distinctly mottled pale brown (10YR 6/3), light brownish gray (2.5Y 6/2), very pale brown (10YR 7/3), and strong brown (7.5YR 5/6) clay; moderate coarse blocky; hard, friable; few fine roots; few pressure faces; thick red clay flows between peds; strongly acid; clear wavy boundary.

2BC—50 to 80 inches; stratified layers of pale brown (10YR 6/3) sandy clay loam, light brownish gray (10YR 6/2) loamy fine sand, brownish yellow (10YR 6/6) fine sandy loam, and yellowish red (5YR 5/6) fine sandy loam; strongly acid.

The thickness of the solum ranges from 40 to 70 inches. Base saturation ranges from 35 to 60 percent at 50 inches below the top of the argillic horizon. The texture of the A and E horizons is loam or fine sandy loam and combined thickness ranges from 6 to 17 inches. Reaction of the A and E horizons ranges from very strongly acid to slightly acid.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3. Where value is less than 3.5, the thickness of the horizon is less than 7 inches.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4.

The Bt horizons have hue of 2.5YR, 5YR, and 7.5YR with value of 3 to 5, and chroma of 4 to 8. The Bt1 and Bt2 horizons have texture of clay or clay loam. The Bt3 and Bt4 horizons have texture of clay, clay loam, sandy clay loam, or loam.

Redoximorphic features with chroma of 2 or less occur in the upper 10 inches of the argillic horizon and are considered as relict and contemporary features. Relict redoximorphic features in shades of red, yellow, brown, and gray occur throughout the horizon. Some pedons have bleached sand and silt coatings or albic material on faces of peds in the lower Bt horizon. Reaction ranges from very strongly acid to moderately acid.

The 2BC and C horizon where present, have hue of 5YR to 10YR, value of 5 to 7, and chroma of 2 to 8. Texture of the 2BC horizon is sandy clay loam, loam, or clay loam and the C horizon is fine sandy loam, loamy fine sand, sandy loam, loamy sand, or sand. Relict iron depletions in shades of gray occur throughout these horizons. Thin strata of clay loam, sandy clay loam, and loam occur in some pedons. Reaction ranges from very strongly acid to slightly acid.

Texla Series

The Texla series consists of very deep, somewhat poorly drained, very slowly permeable soils that formed in loamy and clayey sediments. These soils are on forested flatwoods. Slopes are 0 to 1 percent. The soils of the Texla series are fine-silty, siliceous, active, thermic Oxyaquic Glossudalfs.

Typical pedon of Texla in Texla-Gist complex, 0 to 1 percent slopes; Orange County, Texas; from the intersection of Texas Highway 87 and Interstate Highway 10 in Orange, 7.5 miles north on Texas Highway 87, 1.1 miles east on paved road and 450 feet south of road in woodland. (lat. 30 degrees 13 minutes 33 seconds N. and long. 93 degrees 45 minutes 05 seconds W.)

A—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; weak medium granular structure; slightly hard, very friable; many fine and medium roots; many fine and medium pores; few faint light brownish gray (10YR 6/2) iron depletions with sharp boundaries; very strongly acid; abrupt smooth boundary.

E—4 to 9 inches; light yellowish brown (10YR 6/4) silt loam; weak medium subangular blocky structure; slightly hard, very friable; common fine and medium roots; many medium pores; few faint light brownish gray (10YR 6/2) iron depletions with sharp boundaries; very strongly acid; gradual wavy boundary.

Bt/E—9 to 22 inches; yellowish brown (10YR 5/6) silty clay loam (Bt); moderate medium prismatic structure parting to moderate medium subangular blocky; hard, friable; many coarse and medium, and few fine roots; many medium pores; few distinct reddish yellow (7.5YR 6/8) clay films on surface of prisms; 40 percent pale brown (10YR 6/3) albic material (E) on surface of prisms; few grayish brown (10YR 5/2) krotovina; very strongly acid; gradual wavy boundary.

Btg—22 to 33 inches; grayish brown (10YR 5/2) clay; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, very firm; few fine roots along ped faces; common fine pores; common pressure faces; many fine and medium prominent strong brown (7.5YR 5/6) and few fine prominent red (2.5YR 4/6) iron concentrations with sharp boundaries on ped exteriors; few light gray (10YR 7/1) krotovina; very strongly acid; gradual wavy boundary.

Btssg1—33 to 47 inches; gray (10YR 6/1) clay; moderate medium prismatic structure parting to moderate medium angular blocky; very hard, very firm; few fine roots along ped faces; many fine and medium pores; common pressure faces; common prominent slickensides; common medium prominent red (2.5YR 4/6) and common medium distinct yellowish brown (10YR 5/6) iron concentrations with sharp boundaries; few light gray (10YR 7/1) krotovina; very strongly acid; gradual wavy boundary.

Btssg2—47 to 80 inches; light gray (10YR 7/1) clay; moderate medium prismatic structure parting to moderate medium angular blocky; very hard, very firm; few fine roots along ped faces; few fine pores; common pressure faces; common prominent slickensides; common fine and medium prominent olive (5Y 5/6) and yellow (5Y 7/6) iron concentrations with clear boundaries in ped interiors; few light gray (10YR 7/1) krotovina; few white salt spots; very strongly acid.

The thickness of the solum is more than 80 inches. Weighted average clay content of the particle-size control section ranges from 25 to 34 percent. The Bt/E horizon is saturated 30 or more days mainly during late winter and early spring. Redoximorphic features are considered both contemporary and relict. These soils do not have aquic conditions in most years. Depth to the glossic horizon ranges from 6 to 18 inches.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 1 to 3. Redoximorphic features range from few to common in shades of brown or gray. Reaction is extremely acid or very strongly acid.

The E horizon has hue of 10YR, value of 6 or 7, and chroma of 2 to 4. Redoximorphic features range from few to common in shades of yellow, brown, or gray. Reaction is extremely acid or very strongly acid.

The Bt part of the Bt/E horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 6. Texture is silt loam or silty clay loam. The E part, or albic material, has hue of 10YR, value of 5 to 7, and chroma of 1 to 3. Iron concentrations range from few to many in shades of red, yellow, or brown and are mainly in ped interiors. Some pedons have up to 10 percent brittle masses. Reaction ranges from extremely acid to strongly acid.

The Btg and Btssg horizons have hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Texture is silty clay or clay. Pressure faces range from few in the Bt to common or many in the Btssg horizon. Slickensides range from few to common in the Btssg horizon. Iron concentrations range from few to many in shades of red, yellow, or brown. Iron depletions range from few to common in shades of gray. Some pedons have a few gypsum crystals or other salt concentrations. Reaction ranges from very strongly acid to moderately acid.

Vamont Series

The Vamont series consists of very deep, somewhat poorly drained, very slowly permeable soils that formed in clayey sediments. These soils are on broad forests. Slope ranges from 0 to 2 percent, but typically less than 1 percent. The soils of the Vamont series are fine, smectitic, thermic Oxyaquic Dystuderts.

Typical pedon of Vamont clay, 0 to 2 percent slopes; Orange County, Texas; from the intersection of Texas Highway 105 and Farm Road 1131 about 4.6 miles north of Vidor, 2.75 miles west on Farm Road 1131, 0.15 mile north on private road along ditch and 75 feet east in forest. (lat. 30 degrees 11 minutes 38 seconds N. and Latitude 94 degrees 03 minutes 27 seconds W.)

A—0 to 3 inches; brown (10YR 4/3) clay; weak medium granular structure; hard, firm; many coarse and fine roots; numerous fine and medium pores; few medium distinct yellowish red (5YR 4/6) iron concentrations; strongly acid; clear wavy boundary.

Bw—3 to 11 inches; yellowish brown (10YR 5/6) and light brownish gray (10YR 6/2) clay; weak medium subangular blocky structure; very hard, very firm; common medium and fine roots; few medium distinct yellowish red (5YR 5/6) iron concentrations; strongly acid; gradual wavy boundary.

Bssg1—11 to 30 inches; gray (10YR 6/1) and yellowish brown (10YR 5/6) clay; moderate coarse prismatic structure parting to weak medium subangular blocky very hard, very firm; common slickensides; common fine roots; very strongly acid; gradual wavy boundary.

Bssg2—30 to 47 inches; gray (10YR 6/1) clay; moderate coarse prismatic structure parting to weak medium subangular blocky very hard, very firm; common slickensides; common fine roots; yellowish brown (10YR 5/6) and yellowish red (5YR 5/6) iron concentrations; very strongly acid; gradual wavy boundary.

Bssg3—47 to 80 inches; grayish brown (10YR 5/2), brown (10YR 4/3), yellowish brown (10YR 5/6), and red (2.5YR 4/6) clay; weak coarse prismatic structure parting to weak medium subangular blocky; contains few salt crystals; hard, firm; few fine roots; common slickensides; strongly acid; gradual smooth boundary.

The range in characteristics includes 50 percent on more of the pedon. The thickness of the solum is more than 80 inches. This cyclic soil ranges from about 4 to 12 feet from the top of the microhigh to the center of the microlow. Undisturbed areas have gilgai microrelief with microhighs 6 to 18 inches higher than microlows. Texture is clay or silty clay. The clay content of the particle-size control section ranges from 45 to 60 percent with more than 30 percent silt. Slickensides and wedge-shaped peds begin at a depth ranging from 8 to 25 inches below the soil surface. The soil is usually moist, but during the summer of some years cracks 1 to 2 inches wide extend from the surface to depths of more than 20 inches. Iron-manganese concretions, 2 to 5 millimeters across, range from none to common throughout.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 to 3. Reaction ranges from very strongly acid to slightly acid.

The B horizons have hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 2 to 6, and also yellowish red (5YR 4/6). They contain few to common iron concentrations or depletions in shades of red, yellow, brown, or gray. Reaction ranges from very strongly acid to slightly acid.

The Bssg3 horizon has neutral color with value of 5 to 7 or has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. It contains few to common iron concentrations in shades of red, yellow or brown. Reaction ranges from very strongly acid to neutral.

Veston Series

The Veston series consists of very deep, poorly drained, very slowly permeable soils that formed in sandy and loamy sediments. These soils are in marshes. Slopes are 0 to 1 percent. The soils of the Veston series are fine-silty, mixed, superactive, nonacid, hyperthermic Typic Fluvaquents.

Typical pedon of Veston fine sandy loam, 0 to 1 percent slopes, frequently flooded, tidal; Jefferson County, Texas; from the intersection of Texas Highway 87 and Farm Road 3322 in Sabine Pass, 13.3 miles west on Texas Highway 87 to cattle walkway road and 115 feet north of road (lat. 29 degrees 39 minutes 39 seconds N. and Latitude 94 degrees 05 minutes 41 seconds W.)

A—0 to 3 inches; very dark gray (2.5Y 3/1) fine sandy loam; weak coarse prismatic structure; hard, friable; many fine roots; common fine tubular pores; many medium faint dark gray (2.5Y 4/1) and black (N 2/) masses throughout peds; few fine prominent strong brown (7.5YR 4/6) iron concentrations along root pores; moderately saline; moderately alkaline; abrupt smooth boundary.

Bw—3 to 5 inches; grayish brown (10YR 5/2) fine sandy loam; weak coarse prismatic structure; soft, friable; common fine roots; common fine tubular pores; many medium distinct very dark gray (10YR 3/1) masses; common fine prominent brownish yellow (10YR 6/6) iron concentrations within peds; common fine prominent strong brown (7.5YR 4/6) iron concentrations along root pores; many medium distinct gray (10YR 6/1) iron depletions on faces of peds; strongly saline; moderately alkaline; abrupt smooth boundary.

Ab—5 to 8 inches; dark gray (2.5Y 4/1) very fine sandy loam; weak medium subangular blocky structure; hard, firm; few fine roots throughout; common fine tubular pores; common fine prominent brown (10YR 4/3) iron concentrations within peds, and common fine prominent strong brown (7.5YR 4/6) iron concentrations along root pores; many fine and medium distinct gray (2.5Y 5/1) iron depletions on faces of peds; strongly saline; moderately alkaline; abrupt smooth boundary.

Bg1—8 to 16 inches; gray (2.5Y 5/1) loamy very fine sand; weak coarse prismatic structure; soft, friable; few fine roots on faces of peds; common fine tubular pores; many fine and medium distinct dark gray (2.5Y 4/1) masses; common fine prominent very dark grayish brown (10YR 3/2) masses within peds and common fine prominent yellowish brown (10YR 5/4) iron concentrations along root pores; few seashell fragments; strongly saline; moderately alkaline; abrupt smooth boundary.

Bg2—16 to 26 inches; gray (2.5Y 5/1) very fine sandy loam; weak coarse prismatic structure; hard, firm; few fine roots on faces of peds; common fine tubular pores; many fine and medium distinct dark gray (2.5Y 4/1) masses within peds; common fine prominent yellowish brown (10YR 5/4) iron concentrations along root pores; common fine distinct gray (2.5Y 6/1) iron depletions on faces of peds; strongly saline; moderately alkaline; abrupt smooth boundary.

Ab'—26 to 38 inches; black (2.5Y 2/1) clay loam; weak coarse prismatic structure; hard, firm; few fine roots on faces of peds; common fine tubular pores; common fine and medium prominent very dark grayish brown (10YR 3/2) masses within peds; strongly saline; moderately alkaline; abrupt smooth boundary.

Bg1'—38 to 51 inches; gray (2.5Y 5/1) and (2.5Y 6/1) loam; weak medium subangular blocky structure; hard, firm; few fine roots on faces of peds; few fine tubular pores; common fine prominent olive yellow (2.5Y 6/6) iron concentrations within peds; strongly saline; moderately alkaline; abrupt smooth boundary.

Bg2'—51 to 60 inches; light gray (2.5Y 7/1) and gray (2.5Y 6/1) loam; weak medium subangular blocky structure; hard, firm; few fine roots on faces of peds; few fine tubular pores; common fine prominent olive yellow (2.5Y 6/6) iron concentrations within peds; strongly saline; moderately alkaline; abrupt smooth boundary.

Bg3—60 to 75 inches; white (2.5Y 8/1) clay loam; weak medium subangular blocky structure; hard, firm; few fine roots on faces of peds; few fine tubular pores; common fine prominent olive yellow (2.5Y 6/6) iron concentrations within peds; strongly saline; moderately alkaline; abrupt smooth boundary.

Bg4—75 to 80 inches; white (2.5Y 8/1) clay loam; weak medium subangular blocky structure; hard, firm; few fine roots on faces of peds; few fine tubular pores; common fine prominent olive yellow (2.5Y 6/6) iron concentrations within peds; many fine and medium greenish gray (5BG 6/1) iron depletions along live root channels; 2 percent pitted concretions of calcium carbonate with an iron-magnesium center 2 to 10 millimeters in diameter; strongly saline; moderately alkaline.

The thickness of the solum ranges from 60 to more than 80 inches. This soil is stratified with textures of loamy very fine sand, very fine sandy loam, fine sandy loam, loam, silt loam, clay loam, and silty clay loam. Weighted average clay content of the particle-size control section ranges from 20 to 30 percent, silt 30 to 45 percent, and sand 25 to 70 percent of which there is less than 15 percent fine sand or coarser. Organic carbon decreases irregularly with depth. Buried A and B horizons occur at random in the upper 40 inches.

The A horizon has hue of 10YR to 5Y, value of 2 to 4, and chroma of 1 and 2. Texture is loamy very fine sand, very fine sandy loam, fine sandy loam, loam, and silty clay loam. Iron concentrations range from few to common in shades of yellow or brown. Salinity ranges from slight to strong. Reaction ranges from neutral to moderately alkaline.

Buried A horizons have hue of 10YR to 5Y, value of 2 to 4, and chroma of 1 and 2. Texture is very fine sandy loam, loam, silt loam, clay loam, or silty clay loam. Iron concentrations between peds and along root channels range from few to many in shades of red, yellow, or brown. Salinity ranges from moderate to strong. Reaction is slightly or moderately alkaline.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 to 6. Iron concentrations range from few to many in shades of red, yellow, or brown. Salinity ranges from moderate to strong. Reaction ranges from neutral to moderately alkaline.

The Bg horizon has hue of 10YR to 5Y, value of 5 to 8, and chroma of 1 or 2. Iron concentrations range from few to many in shades of red, yellow, or brown. Salinity ranges from moderate to strong. Reaction is moderately alkaline or strongly alkaline.

Some pedons have a C horizon below 60 inches that have the same color range as the Bg horizon. Texture ranges from loam to clay with strata that are more clayey or sandy. This horizon also has strata, 0.5 to 6 inches thick that have color in shades of red, yellow, or brown. Salinity ranges from moderate to strong.

Viterbo Series

The Viterbo series consists of very deep, somewhat poorly drained, very slowly permeable soils that formed in loamy and clayey sediments. These soils are on prairies. Slopes are 0 to 1 percent. The soils of the Viterbo series are fine, smectitic, hyperthermic Chromic Vertic Epiaqualfs.

Typical pedon of Viterbo silty clay loam, 0 to 1 percent slopes; Jefferson County, Texas; from the intersection of Interstate Highway 10 and U.S. Highways 69, 96, and 287 in southwest Beaumont, 3.6 miles east on U.S. Highways 69, 96, and 287, 3.1 miles southeast on the West Port Arthur Road, 0.5 mile east on FM 517, 600 feet south of road and 200 feet east of canal. (lat. 29 degrees 59 minutes 21 seconds N. and long. 94 degrees 03 minutes 28 seconds W.)

Ap—0 to 7 inches; grayish brown (10YR 5/2) silty clay loam; weak medium subangular blocky structure; hard, firm; common fine roots; few fine prominent strong brown (7.5YR 4/6) stains along roots; few wormcasts; very strongly acid; clear smooth boundary.

Btg1—7 to 17 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium subangular blocky structure; very hard, firm; common fine roots; few fine pores; few distinct dark grayish brown (10YR 4/2) clay films; common fine distinct yellowish brown (10YR 5/6) and common fine prominent red (2.5YR 4/6) iron concentrations; 10 percent crawfish krotovina; very strongly acid; gradual wavy boundary.

Btg2—17 to 35 inches; gray (10YR 5/1) silty clay; moderate medium prismatic structure parting to moderate medium angular blocky; very hard, very firm; few fine roots; few fine pores; few pressure faces; few distinct dark grayish brown (10YR 4/2) clay films; common fine distinct yellowish brown (10YR 5/6) iron concentrations; few fine prominent strong brown (7.5YR 4/6) stains along roots; 10 percent crawfish krotovina; strongly acid; gradual wavy boundary.

Btssg1—35 to 65 inches; gray (10YR 6/1) clay; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, very firm; few fine roots; common distinct slickensides; few distinct clay films; common fine distinct yellowish brown (10YR 5/6) and strong brown (7.5YR 4/6) iron concentrations; 10 percent crawfish krotovina; strongly acid; gradual wavy boundary.

Btssg2—65 to 80 inches; light gray (10YR 7/1) clay; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, very firm; common distinct slickensides; common fine distinct yellowish brown (10YR 5/6) iron concentrations; few crawfish krotovina; strongly acid.

The thickness of the solum is more than 80 inches. The particle-size control section ranges from 35 to 50 percent clay and 25 to 45 percent silt. Depth to slickensides ranges from 30 to 45 inches. This soil has aquic conditions in most years.

The Ap or A horizon has hue 10YR or 2.5Y, value of 4 or 5, and chroma of 1 or 2. Combined thickness of the A and Ap horizons is 4 to 15 inches and the texture is silt loam or silty clay loam. Iron concentrations and stains in shades of red, yellow, and brown range from few to many. Reaction ranges from very strongly acid to slightly acid.

The Btg horizons have hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2. The texture is silty clay loam or silty clay. Iron concentrations in shades of red, yellow, and brown range from few to many. Reaction ranges from very strongly acid to slightly acid.

The Btssg horizons have hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2. The texture is silty clay or clay. Iron concentrations in shades of red, yellow, and brown range from few to many. In less than half of some pedons a few pitted concretions of calcium carbonate are present. Reaction ranges from strongly acid to neutral.

Zummo Series

The Zummo series consists of very deep, very poorly drained, very slowly permeable soils that formed in clayey sediments. These soils are in marshes. Slopes are 0 to 1 percent. The soils of the Zummo series are fine, smectitic, hyperthermic Vertic Endoaquolls.

Typical pedon of Zummo muck, 0 to 1 percent slopes, frequently flooded, tidal; Jefferson County, Texas; from the intersection of Texas Highway 823 and Texas Highway 73 in west Port Arthur, 9.15 miles west on Texas Highway 73, 4.0 miles south, 1.5 miles northeast, and 0.25 mile north on private road and 300 feet west in marsh. (lat. 29 degrees 48 minutes 13 seconds N. and long. 94 degrees 06 minutes 14 seconds W.)

Oa—0 to 8 inches; very dark gray (10YR 3/1) muck; massive; about 25 percent fiber, 5 percent rubbed; very fluid, flows easily between fingers leaving mainly roots in hand (n value of 1.0 to 2.0); many medium roots; strongly acid; clear wavy boundary.

A1—8 to 16 inches; black (10YR 2/1) clay; weak coarse prismatic structure parting to moderate medium subangular blocky; hard, firm; many fine and medium roots; few fine pores; very strongly acid; clear wavy boundary.

A2—16 to 24 inches; very dark gray (10YR 3/1) clay; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm; common fine and medium roots; common fine prominent dark gray (10YR 4/1) iron depletions; few very dark gray (10YR 3/1) krotovina; strongly acid; gradual wavy boundary.

Bg1—24 to 34 inches; dark gray (10YR 4/1) clay; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm; common fine roots; common fine prominent brownish yellow (10YR 6/6) masses of iron accumulation; few very dark gray (10YR 3/1) krotovina; slightly acid; gradual wavy boundary.

Bg2—34 to 46 inches; gray (10YR 6/1) clay; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm; few fine roots; common fine prominent brownish yellow (10YR 6/6) iron concentrations; few very dark gray (10YR 3/1) krotovina; slightly acid; gradual wavy boundary.

Bg3—46 to 66 inches; light gray (10YR 7/1) clay; moderate medium prismatic structure parting to moderate fine subangular blocky; hard, firm; few fine roots; common fine prominent brownish yellow (10YR 6/6) iron concentrations; few very dark gray (10YR 3/1) krotovina; neutral; gradual wavy boundary.

Bg4—66 to 80 inches; light gray (2.5Y 7/1) clay; moderate medium prismatic structure parting to moderate fine subangular blocky; few fine roots; common fine

Bg4—66 to 80 inches; light gray (2.5Y 7/1) clay; moderate medium prismatic structure parting to moderate fine subangular blocky; few fine roots; common fine prominent yellowish brown (10YR 5/8) iron concentrations; few iron-manganese concretions 5 to 10 millimeters; few very dark gray (10YR 3/1) krotovina; neutral; gradual wavy boundary.

The thickness of the solum is more than 80 inches. Thickness of the surface layer with n value of more than 0.7 is less than 16 inches. The thickness of the mollic epipedon, excluding horizons with n values of 0.7 or more, is 10 to 24 inches. The electrical conductivity is less than 2 dS/m throughout.

The Oa horizon has hue of 10YR to 5Y, value of 2 or 3, and chroma of 2 or less. Reaction ranges from very strongly acid to moderately acid. N value ranges from 0.7 to 2.0.

The A horizons have hue of 10YR to 5Y, value of 2 to 4, and chroma of 2 or less. Texture is clay or silty clay. Iron concentrations are few to common in shades of brown or yellow. Reaction ranges from extremely acid to moderately acid.

The Bg1 and Bg2 horizons have hue of 10YR to 5GY, values of 4 to 6, and chroma of 1 or less. Texture is clay or silty clay. Iron concentrations are in shades of yellow or brown. Iron depletions are few to common in shades of gray. Reaction ranges from very strongly acid to slightly acid.

The Bg3 and Bg4 horizons have hue of 10YR to 5GY, values of 6 to 7, and chroma of 1 or less. Texture is clay or silty clay. Iron concentrations are in shades of yellow or brown. Iron-manganese concretions range from none to common. Reaction ranges from strongly acid to neutral.

Formation of the Soils

In this section the factors of soil formation are related to the formation of the soils in Jefferson and Orange Counties. Also, processes of horizon differentiation and the surface geology of the county are described.

Factors of Soil Formation

Soil is formed by the action of soil-forming processes on material deposited or accumulated by geological forces. The characteristics of a soil depend on the physical and mineralogical composition of the parent material, the climate under which the soil material has accumulated and has existed since accumulation, the plant and animal life on and in the soil, the relief, and the length of time the forces of soil development have acted on the soil material.

Climate and living organisms are active factors of soil formation. They act on the parent material that has accumulated and slowly change it into a natural body that has genetically related horizons. The effects of climate and living organisms are conditioned by relief. The parent material affects the kind of soil profile that forms and, in extreme cases, determines it almost entirely. Finally, time is needed for changing the parent material into soil. Generally, a long time is needed for the development of distinct horizons.

The factors of soil formation are so closely interrelated in their effects on the soil that few generalizations can be made regarding the effect of any one factor unless conditions are specified for the other factors.

Parent Material

Parent material is the unconsolidated mass in which a soil forms. It affects the chemical and mineral composition of the soil. The parent material in Jefferson and Orange Counties consists of loamy and clayey sediments deposited by ancient streams and rivers. Some of the loamy and clayey sediments have been reworked and modified by the wind. Some areas have windblown sands. The geology of the parent material is described in the section "Surface Geology."

Climate

Precipitation, temperature, and wind have had a major effect on the formation of soils in Jefferson and Orange Counties.

Wetter or drier climates in the past had an effect on how parent material was deposited. The climate was similar to the present one when the loamy and clayey parent material of the Beaumont, league, Labelle, and Anahuac soils was deposited by rivers. The climate was drier when wind blown loamy sediments were deposited to form the upper portions of the Spindletop, Texla, and Gist soils.

Jefferson and Orange Counties have a humid subtropical climate. The climate is uniform throughout the county. The dominant climatic influence on soil formation has been precipitation, which has caused the translocation of clays. The high amount of rainfall and warm temperatures has resulted in rapid soil formation.

Plant and Animal Life

Plants, microorganisms, earthworms, and other living organisms have contributed to the formation of the soils. They provide organic matter, help to decompose plant residue, influence the chemistry of the soil, and contribute to soil development. Gains in content of organic matter and nitrogen in the soil, gains and losses in plant nutrients, and changes in structure and porosity are caused by plants and animals.

The dominant native vegetation in the southernmost one-third of the survey area consists of marsh plants. Soils that formed under this vegetation such as the Harris, Allemands, Larose, and Zummo soils, have a mucky or dark-colored surface layer that contains an appreciable to high amount of organic matter. Native vegetation in the middle third of the survey area is predominantly prairie grasses.

Soils that formed under this vegetation such as the League and Labelle soils, have a dark-colored surface layer that also contains an appreciable amount of organic matter. In the northernmost parts of the survey area, the native vegetation was dominantly woody plants. Soils that formed under these plants, such as Evadale, Texla, and Gist soils, have a lighter colored surface layer that has less organic matter than the soils that formed under prairie vegetation.

Relief

Relief influences soil development through its effect on drainage and runoff. If other factors are equal, the degree of profile development depends mainly on the ability for water to move through the soil. Soils in Jefferson and Orange Counties formed in areas of low relief, making soil development and water movement onto and through the soil dependent on slope shape. Soils formed on convex slopes, such as Anahuac soils, have a high degree of soil profile development. These soils are better drained, have more vegetation, and allow for good internal downward flow or water. The internal downward flow increases profile development by leaching various minerals into the lower part of the soil profile.

Those soils on linear and concave areas, such as Evadale, Aris, and Camptown have the greatest amount of profile development. These soils drain water slowly or will pond for certain periods of the year. This excess amount of water provides a mechanism for minerals to be stripped from one area of the soil and relocated to another.

Time

The length of time that the soil-forming factors have acted on the parent material determines, to a large degree, the characteristics of the soil. Usually a long time is required for formation of soils that have distinct horizons. In Jefferson and Orange Counties, Bienville soils are young soils that have little horizon development. Morey soils are older soils. They have better developed horizons.

Processes of Horizon Differentiation

Soils are derived from the decomposition of the mineral particles they contain and from the plant and animal remains added to them. Silicate clays, mineral particles, humus, living organisms, and water have a major influence in determining the character of the soil. Soil layers, or horizons, are formed by additions, removals, transfers, and transformations within the soil profile. (20) These processes include additions or losses of organic, mineral, and gaseous materials to the soil, transfers of material from one point to another within the soil, and physical and chemical transformation of mineral and organic materials within the soil. In most soils, more than one of these processes have been active in the development of horizons and many processes occur simultaneously.

Soil profiles are made up of a series of horizons that extend from the surface to the parent material. The parent material has been influenced little by the processes of soil formation. The horizons that make up a soil profile differ in one or more properties, such as color, texture, structure, consistence, porosity, and reaction.

Most profiles have four major horizons. These are the A, E, B, and C horizons. Some soils do not have E or B horizons.

The A horizon is the surface layer. It is the horizon that has the maximum accumulation of organic matter. Organic matter has accumulated, partially decomposed, and been incorporated into the soil. The accumulation of organic matter in soils is greatest in and above the surface layer. Many of the more stable products of organic matter decomposition remain as finely divided materials that result in darker colors, increased water-holding and cation-exchange capacities, and granulation of the soil.

The content of organic matter in the soils in Jefferson and Orange Counties ranges from low to medium. League, Labelle, Morey, Spindletop, and Meaton soils have accumulated sufficient organic matter to form a dark surface layer, or A horizon. Evadale, Aris, Texla, and Camptown soils have a low organic matter light surface layer, or A horizon.

The E horizon is the subsurface layer. It is directly below the A horizon. It is characterized by the leaching of dissolved or suspended materials. Clay particles, organic matter, and oxides of free iron have been leached from the E horizon, leaving a concentration of light-colored sand and silt particles or other resistant materials. Aris, Camptown, Evadale, Texla, and Gist soils have well developed E horizons.

The B horizon is the subsoil. It is directly below the A or E horizons. It is the horizon that has the maximum accumulation of dissolved or suspended materials, such as clay and iron. It may also be an altered horizon that has a distinctly different structure than that of the A horizon but shows little evidence of clay translocation or accumulation.

A B horizon that has a significant amount of clay accumulation is called a Bt horizon. Clay accumulates in horizons largely because of translocation from upper to lower horizons. As water moves downward, it can carry small amounts of clay in suspension. This clay accumulates at depths penetrated by water. It accumulates in fine pores in the soil and as clay films on faces of peds. Over long periods of time, at least a few thousand years, such processes can result in distinct horizons. Morey and Meaton soils are examples of soils that have strongly developed Bt horizons. Labelle soils have a less developed Bt horizon. Labelle soils have clays with a high degree of shrink-swell, which destroys the clay films.

A B horizon that has distinct structure or color development with little or no evidence of clay accumulation is called a Bw horizon. Plant roots and other organisms contribute to the rearrangement of soil materials into secondary aggregates. Organic residues and secretions of organisms serve as cementing agents that help stabilize structural aggregates. Soils that have appreciable amounts of clay develop structural aggregates because of drying and wetting and because of shrinking and swelling.

Some soils in Jefferson and Orange Counties have a high content of clay that has montmorillonite (smectite) as the dominant clay mineral. These soils shrink and develop wide, deep cracks when dry and swell and become very plastic and cohesive when wet. Because of overburden pressure, soil movement, and stress caused by wetting and drying, a platy and wedge-like structure can form in the Bss horizon. Individual structural aggregates have distinct cleavage planes and polished faces known as slickensides. When the soil is dry, soil material from the surface often falls into the wide, deep cracks or is washed into the cracks by rain. When the soil is wet, lateral pressure caused by the swelling can result in surface heaving, which eventually leads to the formation of gilgai microrelief that consists of microhighs and microlows. Beaumont, League, and China soils have Bss horizons that have slickensides. They have gilgai microrelief.

The C horizon is relatively unchanged by soil-forming processes, although in some places it is modified by weathering. It is generally below the B horizon, although no soils have a C horizon below a B horizon in the Jefferson and Orange County survey area. The C horizons are found in alluvial sediments near streams, rivers, and bays. The C horizon is directly below the A horizon. Bancker, Caplen, and Larose soils have C horizons directly below A horizons.

A horizon that is gray and shows evidence of reduction and segregation of iron compounds is designated by the addition of the symbol "g." Relatively long periods of wetness in poorly aerated horizons can reduce the amount of these iron compounds. In the more soluble, reduced form, appreciable amounts of iron can be translocated by water from one position to another within the soil. The presence of brown, yellow, or red mottles in predominantly gray horizons indicates segregation and local concentration of oxidized iron compounds as a result of oxidizing and reducing (wetting and drying) conditions in the soil. Evadale, Aris, and Camptown soils are examples of soils that have mottles in these colors.

Another important process in soil formation is the loss of components from the soil. Water can leach many soluble components, such as calcium carbonate, to the lower horizons in the profile. A horizon that has a significant accumulation of calcium carbonate is designated by the addition of the symbol "k." Morey soils are examples of soils that have accumulations of calcium carbonate in the lower horizons.

Surface Geology

Jefferson and Orange Counties are in the West Gulf Coastal Plain Section of the Coastal Plain Physiographic Province. (12) Jefferson and Orange Counties lie within the drainage basins of the Sabine River and the Neches River. The Sabine River and the Neches River flow into Sabine Lake which drains through Sabine Pass into the Gulf of Mexico.

The surface geology of Jefferson and Orange Counties is depicted on the Beaumont Sheet and the Houston Sheet of the Geologic Atlas of Texas. (4,5) The Environmental Geologic Atlas of the Texas Coastal Zone, Beaumont-Port Arthur Area Environmental Geology Map delineates the age, various depositional systems and resulting textures of surface sediments in each county. (8) Dominant depositional systems affecting soil mapping are fluvial, fluvial-deltaic, marsh-swamp, barrier-strandplain, and map units which include anthropogenic spoil and made-land.

Beaumont Formation

The late-Pleistocene age Beaumont Formation laid down in a fluvial-deltaic depositional environment. The formation is exposed throughout Jefferson and Orange Counties. This formation’s outcrop is the oldest in the survey area. The outcrop surface is almost featureless. However, there are a few relict river channels indicated by meander patterns and meanderbelt ridges. Most of the relict channels control the alignment of present-day intermittent streams. Remnants of late-Pleistocene age beach and barrier island deposits are unique topographic and lithologic features. These remnants are barrier-strandplain sediments that indicate a late Pleistocene Gulf of Mexico shore line.

The Geologic Atlas of Texas delineates three Beaumont Formation map units relative to their depositional environment and sediment textures. (4,5) The most widespread of these units is fluvial sediment, dominantly clayey sand and silt, laid down as meanderbelt, levee, crevasse splay, and distributary sand deposits. The surface is typically level with local mounds and ridges. Typical soils developed in these parent materials are Aris, Morey, and Spindletop.

Subordinate in area to clayey sand and silt is a dominantly smectitic clay unit deposited as interdistributary, abandoned channel-fill, and fluvial overbank muds. The surface of these sediments are mostly level with depressed relief. Typical soils mapped over these parent materials are Beaumont, China, and League.

Relict remnants of barrier islands and beach deposits are mapped northeast of Beaumont in Orange County and southwest of Beaumont in Jefferson County. This unit is probably part of the late-Pleistocene age “Ingleside barrier” island system, segments of which have been mapped as far southwest as the Corpus Christi vicinity. (3,4)(6)(7) The deposits are comprised mostly of fine grained sand. The surface is usually slightly higher than the surrounding topography and characterized by low ridges and numerous pimple mounds and rounded shallow depressions. Soils developed in these coarse grained parent materials are Craigen and Mollco.

Deweyville Formation

The late-Pleistocene to early-Holocene age Deweyville Formation is the substrate for relict fluvial terraces located on the periphery of the Neches River and Sabine River flood plains. The surface of the Deweyville Formation displays relict channel widths, meander radii, and meander scars much larger than those of the subjacent Holocene age flood plains. The larger fluvial features indicate considerably more precipitation in east Texas during late Pleistocene and early Holocene times than is currently recorded.

The apparently large amount of annual rainfall effected a fluvial system capable of transporting coarse siliceous sand, gravel, and silt. These sediments were laid down as point bar, natural levee, and stream channel deposits. Clay and silt was deposited as backswamp muds. Soils that formed in coarse grained parent materials are generally sandy or loamy throughout; and are typified by the Bienville series. The Spurger series is representative of soils that developed in clayey and silty backswamp deposits.

Barrier Island Deposits

Most of the southern boundary of Jefferson County is defined by a Holocene age barrier island at the shoreline of the Gulf of Mexico. The island extends from Sabine Pass southwestward to become a major portion of Bolivar Peninsula. (3)

The deposits comprising the island dunes and beach ridges are dominantly well sorted, fine grained sand with abundant shells and shell fragments. The sand deposits are constantly reworked by storm tides and eolian processes, and with clays and silts associated with marsh sediments to the north. Soils developed in these predominantly sandy parent materials are Sabine. Parent sediments for Veston soils are interbedded clays and silts.

Holocene Marsh and Flood Plain Sediment

An extensive marsh system has developed between the barrier island and the Beaumont Formation in southern Jefferson County. (4) Salinity of this system grades landward from saltwater marsh to fresh water marsh. Much of the marsh is more brackish than saline due principally to the barrier island denying the system direct access to marine water from the Gulf of Mexico. Typical saltwater to brackish marsh soils mapped are the Bancker, Creole, and Scatlake series. Fresh water marsh soils are represented by the Allemands and Zummo series. Fresh water marsh and swamp conditions extend from Sabine Lake up the Neches River and Sabine River where the Barbary and Larose series are mapped.

The youngest authentic geologic sediment in the two counties is Holocene age alluvium deposited on flood plains of the rivers and their major tributaries. These flood plains are graded to present-day mean sea level. This flood plain sediment is clay, silt, and sand with locally abundant organic matter. The sand and silt are being deposited as point bar, natural levee, and stream channel sediments. Clay, silt, and organic matter mostly backswamp deposits,

Typical clayey flood plain soils are the Estes and Fausse series.

Fill and Spoil

This man-made or anthropogenic deposition is considered a geologic outcrop for convenience and to facilitate discussion. These mineral and organic materials fit the definition of soil parent materials for very young soils.

Fill is soil and shell material quarried or dredged for raising land surfaces above alluvium and barrier island deposits and for creating ‘made-land’. The economics of the supply and movement of fill material dictate that generally local sources will be utilized for fill. Local sources are mostly fluvial sediments and dredged marsh-swamp material from canal maintenance. Made-land soils are exemplified by Neel series.

Spoil is dredged material placed along man-made waterways. Spoil from the construction and maintenance of ship canals are mostly marsh-swamp and bay-estuary sediments. Physical characteristics of Spoil are subject to accretion and erosion from canal maintenance, storms and tidal processes. Ijam and Neches soils are mapped in these sediments.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Albic material. (L. albus, white) materials are soil materials with a color that is largely determined by the color of primary sand and silt particles rather than by the color of their coatings. This implies that clay and/or free iron oxides have been removed from the materials or that the oxides have been segregated to such an extent that the color of the minerals is largely determined by the color of the primary particles.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha, alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

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.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedding plane. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Bottom land. The normal flood plain of a stream, subject to flooding.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Caliche. A more or less cemented deposit of calcium carbonate in soils of warm-temperate, subhumid to arid areas. Caliche occurs as soft thin layers in the soil or as hard, thick beds directly beneath the solumn, or it is exposed at the surface by erosion.

California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

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 depletions. See Redoximorphic features.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil. Sand or loamy sand.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas 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 or miscellaneous areas are somewhat similar in all areas.

Compressible (in tables). Excessive decrease in volume of soft soil under load.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

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. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

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.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

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.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave (in tables)**.** The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Delta. A body of alluvium having a surface that is fan shaped; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

Dense layer (in tables)**.** A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained*, and *very poorly drained*. These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Dredge spoil. Material that has been dredged from rivers, bays, and canals.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Ecological site. An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind or proportion of species or total production.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

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.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Excess lime (in tables). Excess carbonates in the soil that restrict the growth of some plants.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Excess sodium (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

Excess sulfur (in tables). Excessive amount of sulfur in the soil. The sulfur causes extreme acidity if the soil is drained, and the growth of most plants is restricted.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fill slope. A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil. Sandy clay, silty clay, or clay.

Firebreak. An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. The nearly level plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Footslope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragile (in tables). A soil that is easily damaged by use or disturbance.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables)**.** Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

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.

Gilgai. Commonly, a succession of microlows and microhighs in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

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 as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A small channel 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.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Head out. To form a flower head.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and may depend on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

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 A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

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 soil material. 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.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock that was formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

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

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions. Low chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

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.

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.

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Large stones (in tables)**.** Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mesa. A broad, nearly flat topped and commonly isolated upland mass characterized by summit widths, that are more than the heights of bounding erosional scarps.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

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. Descriptive terms are as follows: abundance—*few, common*, and *many; size—fine, medium*, and *coarse*; and *contrast—faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch)*; medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch)*;* and *coarse,* more than 15 millimeters (about 0.6 inch).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

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 with hue of 10YR, value of 6, and chroma of 4.

n value. The n value (Pons and Zonnveld, 1965) characterizes the relation between the percentage of water in a soil under field conditions and its percentages of inorganic clay and humus. The n value is helpful in predicting whether a soil can be grazed by livestock or can support other loads and in predicting what degree of subsidence would occur. The critical n value of 0.7 can be approximated closely in the field by a simple test of squeezing a soil sample in the hand. If the soil flows between the fingers with difficulty, the n value is between 0.7 and 1.0 (slightly fluid manner of failure class); if the soil flows easily between the fingers, the n value is 1 or more (moderately fluid or very fluid manner of failure class). [Keys to Soil Taxonomy, 2003]

Natric horizon. A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

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. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan*, and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment. A thin layer of alluvial material that mantles an erosion surface and has been transported to its present position from higher lying areas of the erosion surface.

Pedon. The smallest volume that can be called "a soil." A pedon is three-dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 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

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Piping (in tables)**.** Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting (in tables)**.** Pits caused by melting around ice. They form on the soil after plant cover is removed.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

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 or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poor outlets (in tables)**.** Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

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.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Range condition. The present composition of the plant community on a ecological site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannahs, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed as 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:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly 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

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha, alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

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

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

Rooting depth (in tables)**.** Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Salty water (in tables)**.** Water that is too salty for consumption by livestock.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

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.

Saprolite. Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Scarification. The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Second bottom. The first terrace above the normal flood plain (or first bottom) of a river.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables)**.** The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. 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 (in tables)**.** The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

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

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

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.

Sinkhole. A depression in the landscape where limestone has been dissolved.

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.

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

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil generally is silty or clayey, is slippery when wet, and is low in productivity.

Slippage (in tables)**.** Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Nearly level	0 to 1 percent
Gently sloping	1 to 3 percent
Moderately sloping	3 to 5 percent

Slope (in tables)**.** Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Sloughed till. Water-saturated till that has flowed slowly downhill from its original place of deposit by glacial ice. It may rest on other till, on glacial outwash, or on a glaciolacustrine deposit.

Slow intake (in tables)**.** The slow movement of water into the soil.

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

Small stones (in tables)**.** Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Sodic (alkali) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^+ to Ca^{++} + Mg^{++}. The degrees of sodicity and their respective ratios are:

Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

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 and by the passage 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 material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.
Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.
Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless soils are either single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).
Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.
Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.
Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.
Substratum. See Underlying material.
Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.
Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.
Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."
Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.
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. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.
Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.
Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.
Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."
Thin layer (in tables)**.** Otherwise suitable soil material that is too thin for the specified use.
Till plain. An extensive area of nearly level to undulating soils underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The outermost inclined surface at the base of a hill; part of a footslope.

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.

Toxicity (in tables)**.** Excessive amount of toxic substances, such as sodium or sulfur, that severely hinder establishment of vegetation or severely restrict plant growth.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tuff. A compacted deposit that is 50 percent or more volcanic ash and dust.

Unstable fill (in tables)**.** Risk of caving or sloughing on banks of fill material.

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

Underlying material. The part of the soil below the solum.

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

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

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

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1971-2000 at Port Arthur, Texas)

Month	Temperature					Precipitation					
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have: Maximum temperature higher than	2 years in 10 will have: Minimum temperature lower than	Average number of growing degree days*	Average	2 years in 10 will have: Less than	2 years in 10 will have: More than	Average number of days with 0.10 inch or more	Average total snow fall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January	61.5	43.0	52.2	79	22	161	5.69	2.88	8.39	7	0.1
February	65.4	46.0	55.7	81	25	208	3.35	1.31	5.31	4	0.1
March	72.0	52.6	62.3	84	30	390	3.75	1.73	5.74	5	0.0
April	77.8	58.9	68.3	89	39	549	3.84	1.21	6.14	4	0.0
May	84.3	66.7	75.5	93	51	790	5.83	1.77	10.25	5	0.0
June	89.4	72.6	81.0	96	60	930	6.58	2.90	10.03	6	0.0
July	91.6	74.1	82.9	98	68	1,019	5.23	2.84	7.16	7	0.0
August	91.7	73.6	82.6	100	66	1,012	4.85	2.22	7.23	6	0.0
September	88.0	69.8	78.9	98	51	868	6.10	2.35	9.15	7	0.0
October	80.5	60.0	70.2	92	39	628	4.67	1.61	7.66	4	0.0
November	70.9	51.1	61.0	85	30	347	4.75	2.43	7.03	6	0.0
December	63.8	44.7	54.3	80	22	198	5.25	2.67	7.05	6	0.0
Yearly:											
Average	78.1	59.4	68.7	---	---	---	---	---	---	---	---
Extreme	108	12	---	100	19	---	---	---	---	---	---
Total	---	---	---	---	---	7,100	59.88	49.53	70.21	67	0.2

*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 (Threshold: 50.0 degrees F)

Table 2.--Freeze Dates in Fall and Spring

(Recorded in the period 1971-2000 at Port Arthur, Texas)

Probability	Temperature: 24°F or lower	Temperature: 28°F or lower	Temperature: 32°F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	February 8	February 28	March 20
2 years in 10 later than--	January 27	February 18	March 8
5 years in 10 later than--	December 28	January 29	February 14
First freezing temperature in fall:			
1 year in 10 earlier than--	December 7	November 28	November 10
2 years in 10 earlier than--	December 21	December 7	November 19
5 years in 10 earlier than--	January 23	December 24	December 6

Table 3.--Growing Season

(Recorded for the period 1971-2000 at Port Arthur, Texas)

Probability	Daily Minimum Temperature during growing season: Number of days higher than 24°F	Number of days higher than 28°F	Number of days higher than 32°F
9 years in 10	309	284	250
8 years in 10	333	299	266
5 years in 10	> 365	331	295
2 years in 10	> 365	> 365	324
1 year in 10	> 365	> 365	339

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Jefferson County	Orange County	Total Area	Total Extent
		Acres	Acres	Acres	Pct
AmA	Allemands mucky peat, 0 to 1 percent slopes, frequently flooded, tidal	3,856	---	3,856	0.4
AnA	Anahuac very fine sandy loam, 0 to 2 percent slopes	8,598	1,573	10,171	1.2
AsA	Anahuac-Aris complex, 0 to 1 percent slopes	19,848	1,378	21,226	2.4
AuA	Anahuac-Urban land complex, 0 to 2 percent slopes	3,205	258	3,463	0.4
BaA	Bancker mucky peat, 0 to 1 percent slopes, frequently flooded, tidal	15,466	7,983	23,449	2.7
BbA	Barbary mucky clay, 0 to 1 percent slopes, frequently flooded	14	8,695	8,709	1.0
BcA	Barnett mucky peat, 0 to 1 percent slopes, frequently flooded, tidal	17,357	451	17,808	2.0
BeA	Barnett silty clay loam, 0 to 1 percent slopes, frequently flooded, tidal	3,021	---	3,021	0.3
Bh	Beaches, very frequently flooded, tidal	901	---	901	0.1
BmA	Beaumont clay, 0 to 1 percent slopes	53,900	172	54,072	6.2
BnA	Bevil clay, 0 to 1 percent slopes	4,661	132	4,793	0.5
BsB	Bienville loamy fine sand, 1 to 3 percent slopes	---	1,314	1,314	0.1
BtA	Bienville-Camptown complex, 0 to 1 percent slopes	809	2,552	3,361	0.4
BwA	Bleakwood loam, 0 to 1 percent slopes, frequently flooded	---	3,639	3,639	0.4
CaA	Camptown silt loam, ponded, 0 to 1 percent slopes	---	7,394	7,394	0.8
CeA	Caplen mucky peat, 0 to 1 percent slopes, frequently flooded, tidal	15,381	2,306	17,687	2.0
ChA	China clay, 0 to 1 percent slopes	12,727	---	12,727	1.4
CrA	Craigen loamy fine sand, 0 to 2 percent slopes	6,031	3,739	9,770	1.1
CsA	Creole mucky peat, 0 to 1 percent slopes, frequently flooded, tidal	16,655	83	16,738	1.9
EsA	Estes clay, 0 to 1 percent slopes, frequently flooded	11,452	2,128	13,580	1.5
EvA	Evadale silt loam, 0 to 1 percent slopes	---	8,476	8,476	1.0
FaA	Fausse clay, 0 to 1 percent slopes, frequently flooded	3,656	6,640	10,296	1.2
FrA	Franeau clay, 0 to 1 percent slopes, occasionally flooded, tidal	12,324	70	12,394	1.4
HaA	Harris clay, 0 to 1 percent slopes, frequently flooded, tidal	11,227	160	11,387	1.3
ImA	Ijam clay, 0 to 2 percent slopes, frequently flooded, tidal	8,785	5,273	14,058	1.6
LaA	Labelle silt loam, 0 to 1 percent slopes	21,278	6,754	28,032	3.2
LbA	Labelle-Anahuac complex, 0 to 1 percent slopes	1,032	510	1,542	0.2
LcA	Labelle-Aris complex, 0 to 1 percent slopes	11,035	---	11,035	1.3
LdA	Labelle-Levac complex, 0 to 1 percent slopes	32,332	2,884	35,216	4.0
LeA	Labelle-Urban land complex, 0 to 1 percent slopes	26,038	---	26,038	3.0
LmA	Larose mucky peat, 0 to 1 percent slopes, frequently flooded	3,547	2,540	6,087	0.7
LtA	League clay, 0 to 1 percent slopes	64,594	---	64,594	7.4
LuA	League-Urban land complex, 0 to 1 percent slopes	24,032	---	24,032	2.7
LvA	Leerco muck, 0 to 1 percent slopes, frequently flooded, tidal	23,576	971	24,547	2.8

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Jefferson County	Orange County	Total	
				Area	Extent
		Acres	Acres	Acres	Pct
LwA	Leton loam, ponded, 0 to 1 percent slopes	7,221	435	7,656	0.9
McA	Meaton-Levac complex, 0 to 1 percent slopes, occasionally flooded, tidal	9,568	---	9,568	1.1
MeA	Meaton-Spindletop complex, 0 to 1 percent slopes, occasionally flooded, tidal	10,588	---	10,588	1.2
MmA	Mollco fine sandy loam, ponded, 0 to 1 percent slopes	1,367	1,485	2,852	0.3
MoA	Mollco-Craigen complex, 0 to 1 percent slopes	3,853	2,648	6,501	0.7
MrA	Morey-Levac complex, 0 to 1 percent slopes	27,195	1,185	28,380	3.2
MsA	Morey-Spindletop complex, 0 to 1 percent slopes	6,095	740	6,835	0.8
NcC	Neches coarse sand, 2 to 5 percent slopes	1,370	2,517	3,887	0.4
NeA	Neel clay, 2 to 5 percent slopes, occasionally flooded, tidal	4,463	73	4,536	0.5
NuC	Neel-Urban land complex, 2 to 5 percent slopes, rarely flooded, tidal	10,970	1,053	12,023	1.4
OaB	Orcadia silt loam, 0 to 2 percent slopes	379	4,666	5,045	0.6
OcA	Orcadia-Anahuac complex, 0 to 1 percent slopes	---	19,845	19,845	2.3
OsA	Orcadia-Aris complex, 0 to 1 percent slopes	8,747	14,658	23,405	2.7
OuA	Orcadia-Urban land complex, 0 to 2 percent slopes	2,428	14,746	17,174	2.0
Ow	Oil wasteland	1,541	---	1,541	0.2
Ps	Pits, sand	275	817	1,092	0.1
SbA	Sabine-Baines complex, 0 to 2 percent slopes, frequently flooded, tidal	5,468	---	5,468	0.6
ScA	Scatlake mucky clay, 0 to 1 percent slopes, very frequently flooded, tidal	4,096	---	4,096	0.5
SpA	Spurger loam, 0 to 2 percent slopes	232	2,116	2,348	0.3
StA	Spurger-Camptown complex, 0 to 1 percent slopes	200	5,776	5,976	0.7
TaA	Texla silt loam, 0 to 1 percent slopes	---	18,143	18,143	2.1
TeB	Texla-Evadale complex, 0 to 1 percent slopes	123	33,639	33,762	3.8
TgA	Texla-Gist complex, 0 to 1 percent slopes	---	12,172	12,172	1.4
VaA	Vamont clay, 0 to 2 percent slopes	3,131	2,411	5,542	0.6
VeA	Veston fine sandy loam, 0 to 1 percent slopes, frequently flooded, tidal	5,725	---	5,725	0.7
VtA	Viterbo silty clay loam, 0 to 1 percent slopes	13,327	35	13,362	1.5
W	Water	50,727	23,792	74,519	8.5
ZuA	Zummo muck, 0 to 1 percent slopes, frequently flooded, tidal	18,626	1,796	20,422	2.3
	Total	635,053	242,823	877,876	100.0

Table 5.--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
AnA	Anahuac very fine sandy loam, 0 to 2 percent slopes
AsA	Anahuac-Aris complex, 0 to 1 percent slopes (Prime farmland if drained)
BmA	Beaumont clay, 0 to 1 percent slopes (Prime farmland if drained)
ChA	China clay, 0 to 1 percent slopes
EvA	Evadale silt loam, 0 to 1 percent slopes (Prime farmland if drained)
LaA	Labelle silt loam, 0 to 1 percent slopes
LbA	Labelle-Anahuac complex, 0 to 1 percent slopes
LcA	Labelle-Aris complex, 0 to 1 percent slopes (Prime farmland if drained)
LdA	Labelle-Levac complex, 0 to 1 percent slopes
LtA	League clay, 0 to 1 percent slopes
MrA	Morey-Levac complex, 0 to 1 percent slopes
MsA	Morey-Spindletop complex, 0 to 1 percent slopes
OaB	Orcadia silt loam, 0 to 2 percent slopes
OcA	Orcadia-Anahuac complex, 0 to 1 percent slopes
OsA	Orcadia-Aris complex, 0 to 1 percent slopes (Prime farmland if drained)
SpA	Spurger loam, 0 to 2 percent slopes
TaA	Texla silt loam, 0 to 1 percent slopes
TeB	Texla-Evadale complex, 0 to 1 percent slopes (Prime farmland if drained)
TgA	Texla-Gist complex, 0 to 1 percent slopes
VaA	Vamont clay, 0 to 2 percent slopes

Table 6.--Irrigated and Nonirrigated Yields

(Yields in the "N" columns are for nonirrigated areas; those in the "I" columns are for irrigated areas. Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil.)

Map symbol and soil name	Land capability		Bahiagrass		Common bermudagrass		Improved bermudagrass		Rice	
	N	I	N	I	N	I	N	I	N	I
			AUM	AUM	AUM	AUM	AUM	AUM	Bu	Bu
AmA:										
Allemands	8w	---	---	---	---	---	---	---	---	---
AnA:										
Anahuac	2w	2w	8.00	---	6.00	---	10.00	---	---	95.00
AsA:										
Anahuac	2w	2w	8.00	---	6.00	---	10.00	---	---	95.00
Aris	4w	4w	4.00	---	4.50	---	---	---	---	95.00
AuA:										
Anahuac	2w	2w	8.00	---	6.00	---	10.00	---	---	95.00
Urban land	8s	---	---	---	---	---	---	---	---	---
BaA:										
Bancker	8w	---	---	---	---	---	---	---	---	---
BbA:										
Barbary	8w	---	---	---	---	---	---	---	---	---
BcA:										
Barnett	6w	---	---	---	---	---	---	---	---	---
BeA:										
Barnett	6w	---	---	---	---	---	---	---	---	---
Bh:										
Beaches	8s	---	---	---	---	---	---	---	---	---
BmA:										
Beaumont	4w	4w	---	---	6.00	---	---	---	---	110.00
BnA:										
Bevil	4w	4w	---	---	6.50	---	---	---	---	110.00
BsB:										
Bienville	2s	---	6.50	---	7.00	---	11.00	---	---	---
BtA:										
Bienville	2s	---	6.50	---	7.00	---	11.00	---	---	---
Camptown	7w	---	---	---	---	---	---	---	---	---
BwA:										
Bleakwood	5w	---	---	---	---	---	---	---	---	---
CaA:										
Camptown	7w	---	---	---	---	---	---	---	---	---
CeA:										
Caplen	8w	---	---	---	---	---	---	---	---	---

Table 6.--Irrigated and Nonirrigated Yields--Continued

Map symbol and soil name	Land capability		Bahiagrass		Common bermudagrass		Improved bermudagrass		Rice	
	N	I	N	I	N	I	N	I	N	I
			AUM	AUM	AUM	AUM	AUM	AUM	Bu	Bu
ChA:										
China	3w	3w	4.00	---	4.50	---	---	---	---	115.00
CrA:										
Craigen	3s	---	7.00	---	7.00	---	---	---	---	---
CsA:										
Creole	7w	---	---	---	---	---	---	---	---	---
EsA:										
Estes	5w	---	2.50	---	2.00	---	---	---	---	---
EvA:										
Evadale	4w	---	5.00	---	5.50	---	---	---	---	75.00
FaA:										
Fausse	7w	---	---	---	---	---	---	---	---	---
FrA:										
Franeau	6w	---	---	---	6.00	---	---	---	---	90.00
HaA:										
Harris	7w	---	---	---	---	---	---	---	---	---
ImA:										
Ijam	7w	---	---	---	---	---	---	---	---	---
LaA:										
Labelle	3w	3w	7.50	---	8.50	---	---	---	---	135.00
LbA:										
Labelle	3w	3w	7.50	---	8.50	---	---	---	---	135.00
Anahuac	2w	2w	8.00	---	6.00	---	10.00	---	---	95.00
LcA:										
Labelle	3w	3w	7.50	---	8.50	---	---	---	---	135.00
Aris	4w	4w	4.00	---	4.50	---	---	---	---	95.00
LdA:										
Labelle	3w	3w	7.50	---	8.50	---	---	---	---	135.00
Levac	3w	3w	5.50	---	4.50	---	---	---	---	95.00
LeA:										
Labelle	3w	3w	7.50	---	8.50	---	---	---	---	135.00
Urban land	8s	---	---	---	---	---	---	---	---	---
LmA:										
Larose	8w	---	---	---	---	---	---	---	---	---
LtA:										
League	3w	3w	7.00	---	6.50	---	---	---	---	135.00

Table 6.--Irrigated and Nonirrigated Yields--Continued

Map symbol and soil name	Land capability N	Land capability I	Bahiagrass N	Bahiagrass I	Common bermudagrass N	Common bermudagrass I	Improved bermudagrass N	Improved bermudagrass I	Rice N	Rice I
			AUM	AUM	AUM	AUM	AUM	AUM	Bu	Bu
LuA:										
League	3w	3w	7.00	---	6.50	---	---	---	---	135.00
Urban land	8s	---	---	---	---	---	---	---	---	---
LvA:										
Leerco	7w	---	---	---	---	---	---	---	---	---
LwA:										
Leton	4w	---	4.00	---	4.00	---	---	---	---	90.00
McA:										
Meaton	4w	4w	4.00	---	5.50	---	---	---	---	100.00
Levac	3w	3w	5.50	---	4.50	---	---	---	---	95.00
MeA:										
Meaton	4w	4w	4.00	---	5.50	---	---	---	---	100.00
Spindletop	2w	---	6.00	---	6.00	---	---	---	---	95.00
MmA:										
Mollco	6w	---	---	---	---	---	---	---	---	---
MoA:										
Mollco	6w	---	---	---	---	---	---	---	---	---
Craigen	3s	---	7.00	---	7.00	---	---	---	---	---
MrA:										
Morey	3w	3w	---	---	8.50	---	8.00	---	---	120.00
Levac	3w	3w	5.50	---	4.50	---	---	---	---	95.00
MsA:										
Morey	3w	3w	---	---	8.50	---	8.00	---	---	120.00
Spindletop	2w	---	6.00	---	6.00	---	---	---	---	95.00
NcC:										
Neches	3w	---	---	---	---	---	5.00	---	---	---
NeA:										
Neel	4s	---	---	---	2.00	---	---	---	---	---
NuC:										
Neel	4s	---	---	---	2.00	---	---	---	---	---
Urban land	8s	---	---	---	---	---	---	---	---	---
OaB:										
Orcadia	3w	---	6.50	---	6.50	---	---	---	---	90.00
OcA:										
Orcadia	3w	---	6.50	---	6.50	---	---	---	---	90.00
Anahuac	2w	2w	8.00	---	6.00	---	10.00	---	---	95.00
OsA:										
Orcadia	3w	---	6.50	---	6.50	---	---	---	---	90.00

Table 6.--Irrigated and Nonirrigated Yields--Continued

Map symbol and soil name	Land capability		Bahiagrass		Common bermudagrass		Improved bermudagrass		Rice	
	N	I	N	I	N	I	N	I	N	I
			AUM	AUM	AUM	AUM	AUM	AUM	Bu	Bu
Aris---------------	4w	4w	4.00	---	4.50	---	---	---	---	95.00
OuA:										
Orcadia------------	3w	---	6.50	---	6.50	---	---	---	---	90.00
Urban land---------	8s	---	---	---	---	---	---	---	---	---
Ow:										
Oil wasteland------	8s	---	---	---	---	---	---	---	---	---
Ps:										
Pits, sand---------	8s	---	---	---	---	---	---	---	---	---
SbA:										
Sabine-------------	3s	---	6.00	---	6.00	---	6.00	---	---	---
Baines-------------	7w	---	---	---	---	---	---	---	---	---
ScA:										
Scatlake-----------	8w	---	---	---	---	---	---	---	---	---
SpA:										
Spurger------------	3e	---	8.00	---	7.00	---	8.00	---	---	---
StA:										
Spurger------------	3e	---	8.00	---	7.00	---	8.00	---	---	---
Camptown-----------	7w	---	---	---	---	---	---	---	---	---
TaA:										
Texla--------------	3w	---	6.00	---	5.50	---	---	---	---	85.00
TeB:										
Texla--------------	3w	---	6.00	---	5.50	---	---	---	---	85.00
Evadale------------	4w	---	5.00	---	5.50	---	---	---	---	75.00
TgA:										
Texla--------------	3w	---	6.00	---	5.50	---	---	---	---	85.00
Gist---------------	2w	---	7.00	---	7.00	---	8.00	---	---	---
VaA:										
Vamont-------------	3e	---	---	---	5.00	---	---	---	---	---
VeA:										
Veston-------------	6w	---	---	---	---	---	---	---	---	---
VtA:										
Viterbo------------	4w	---	5.50	---	5.50	---	---	---	---	110.00
W:										
Water--------------	---	---	---	---	---	---	---	---	---	---
ZuA:										
Zummo--------------	7w	---	---	---	---	---	---	---	---	---

Table 7.--Rangeland Productivity

(Only the soils that support rangeland vegetation suitable for grazing are rated.)

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
AmA:				
Allemands	Fluid Fresh Marsh	14,000	11,000	9,000
AnA:				
Anahuac	Loamy Prairie	8,500	6,500	5,000
AsA:				
Anahuac	Loamy Prairie	8,500	6,500	5,000
Aris	Lowland	8,000	6,000	4,000
AuA:				
Anahuac	Loamy Prairie	8,500	6,500	5,000
Urban land	---	---	---	---
BaA:				
Bancker	Fluid Brackish Marsh	11,000	9,000	6,000
BbA:				
Barbary	---	1,150	900	750
BcA:				
Barnett	Firm Intermediate Marsh	12,000	9,000	6,000
BeA:				
Barnett	Firm Brackish Marsh	11,000	9,000	6,000
Bh:				
Beaches	---	---	---	---
BmA:				
Beaumont	Blackland	9,000	7,000	6,000
BnA:				
Bevil	---	1,400	1,200	1,000
BsB:				
Bienville	---	1,400	1,200	1,000
BtA:				
Bienville	---	1,400	1,200	1,000
Camptown	---	1,150	1,000	850
BwA:				
Bleakwood	---	1,400	1,200	1,000
CaA:				
Camptown	---	1,150	1,000	850
CeA:				
Caplen	Fluid Intermediate Marsh	10,000	8,000	6,000
ChA:				
China	Blackland	9,500	7,500	6,500

Table 7.--Rangeland Productivity--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
CrA:				
Craigen	---	1,700	1,500	1,300
CsA:				
Creole	Firm Brackish Marsh	11,000	9,000	6,000
EsA:				
Estes	---	1,300	1,100	900
EvA:				
Evadale	---	1,500	1,300	1,100
FaA:				
Fausse	---	1,300	1,100	900
FrA:				
Franeau	Salty Prairie	10,000	8,000	7,000
HaA:				
Harris	Firm Intermediate Marsh	12,000	9,000	6,000
ImA:				
Ijam	Firm Intermediate Marsh	10,000	8,000	6,000
LaA:				
Labelle	Loamy Prairie	8,500	6,500	5,000
LbA:				
Labelle	Loamy Prairie	8,500	6,500	5,000
Anahuac	Loamy Prairie	8,500	6,500	5,000
LcA:				
Labelle	Loamy Prairie	8,500	6,500	5,000
Aris	Lowland	8,000	6,000	4,000
LdA:				
Labelle	Loamy Prairie	8,500	6,500	5,000
Levac	Loamy Prairie	8,000	6,000	4,500
LeA:				
Labelle	Loamy Prairie	8,500	6,500	5,000
Urban land	---	---	---	---
LmA:				
Larose	Fluid Fresh Marsh	14,000	11,000	9,000
LtA:				
League	Blackland	9,500	7,500	6,500
LuA:				
League	Blackland	9,500	7,500	6,500
Urban land	---	---	---	---
LvA:				
Leerco	Firm Intermediate Marsh	12,000	9,000	6,000

Table 7.--Rangeland Productivity--Continued

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
LwA:				
Leton	Lowland	8,000	6,000	4,000
McA:				
Meaton	Loamy Prairie	9,000	8,000	7,000
Levac	Loamy Prairie	8,000	6,000	4,500
MeA:				
Meaton	Loamy Prairie	9,000	8,000	7,000
Spindletop	Loamy Prairie	8,500	6,500	5,000
MmA:				
Mollco	---	1,150	1,000	850
MoA:				
Mollco	---	1,150	1,000	850
Craigen	---	1,700	1,500	1,300
MrA:				
Morey	Loamy Prairie	8,500	6,000	5,000
Levac	Loamy Prairie	8,000	6,000	4,500
MsA:				
Morey	Loamy Prairie	8,500	6,000	5,000
Spindletop	Loamy Prairie	8,500	6,500	5,000
NcC:				
Neches	Loamy Prairie	8,000	6,000	4,500
NeA:				
Neel	Salty Prairie	9,000	7,000	6,000
NuC:				
Neel	Salty Prairie	---	---	---
Urban land	---	---	---	---
OaB:				
Orcadia	Loamy Prairie	8,500	6,500	5,000
OcA:				
Orcadia	Loamy Prairie	8,500	6,500	5,000
Anahuac	Loamy Prairie	8,500	6,500	5,000
OsA:				
Orcadia	Loamy Prairie	8,500	6,500	5,000
Aris	Lowland	8,000	6,000	4,000
OuA:				
Orcadia	---	---	---	---
Urban land	---	---	---	---

Table 7.--Rangeland Productivity--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Total dry-weight production: Normal year	Total dry-weight production: Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
Ow:				
Oil wasteland	---	---	---	---
Ps:				
Pits, sand	---	---	---	---
SbA:				
Sabine	Sandy Chenier	7,500	5,000	4,000
Baines	Firm Brackish Marsh	11,000	9,000	6,000
ScA:				
Scatlake	Fluid Saline Marsh	12,000	11,000	9,000
SpA:				
Spurger	---	1,700	1,500	1,300
StA:				
Spurger	---	1,700	1,500	1,300
Camptown	---	1,150	1,000	850
TaA:				
Texla	---	1,700	1,500	1,300
TeB:				
Texla	---	1,700	1,500	1,300
Evadale	---	1,500	1,300	1,100
TgA:				
Texla	---	1,700	1,500	1,300
Gist	---	1,700	1,500	1,300
VaA:				
Vamont	---	1,400	1,200	1,000
VeA:				
Veston	Loamy Chenier	11,000	8,500	7,000
VtA:				
Viterbo	Loamy Prairie	8,500	6,500	5,000
W:				
Water	---	---	---	---
ZuA:				
Zummo	Firm Fresh Marsh	14,000	11,000	9,000

Table 8.--Forestland Productivity

(The map units listed are used for commercial pine production.)

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			Bd ft/ac	
BnA:				
Bevil	loblolly pine	90	330	cherrybark oak, green ash, loblolly pine, sweetgum, water oak
	water oak	75	---	
BsB:				
Bienville	loblolly pine	95	395	ash, loblolly pine, shortleaf pine, southern red oak, sweetgum
BtA:				
Bienville	loblolly pine	95	395	ash, loblolly pine, shortleaf pine, southern red oak, sweetgum
Camptown	red maple	---	---	water oak
	water oak	60		
BwA:				
Bleakwood	sweetgum	100	310	cherrybark oak, green ash, sweetgum, willow oak
	water oak	100	---	
	willow oak	100	---	
CrA:				
Craigen	loblolly pine	90	330	blackgum, loblolly pine, sweetgum, water oak, white oak
EsA:				
Estes	sweetgum	90	210	cherrybark oak, green ash, sweetgum, willow oak
	water oak	90	---	
	willow oak	90	---	
EvA:				
Evadale	loblolly pine	98	460	blackgum, green ash, loblolly pine, sweetgum, water oak, willow oak
	water oak	90	---	
MmA:				
Mollco	water oak	70	280	baldcypress, laurel oak, red maple, willow oak
MoA:				
Mollco	water oak	70	280	baldcypress, laurel oak, red maple, willow oak

Table 8.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			Bd ft/ac	
Craigen	loblolly pine	90	330	blackgum, loblolly pine, sweetgum, water oak, white oak
SpA:				
Spurger	loblolly pine	105	525	ash, blackgum, cherrybark oak, loblolly pine, shortleaf pine, sweetgum, water oak
	sweetgum	105	350	
StA:				
Spurger	loblolly pine	105	525	ash, blackgum, cherrybark oak, loblolly pine, shortleaf pine, sweetgum, water oak
	sweetgum	105	350	
Camptown	---	---	---	water oak
TaA:				
Texla	loblolly pine	90	330	ash, loblolly pine, sweetgum, water oak
	water oak	75	---	
TeB:				
Texla	loblolly pine	90	330	ash, loblolly pine, sweetgum, water oak
	water oak	75	---	
Evadale	loblolly pine	98	460	blackgum, green ash, loblolly pine, sweetgum, water oak, willow oak
	water oak	90	---	
TgA:				
Texla	loblolly pine	90	330	ash, loblolly pine, sweetgum, water oak
	water oak	75	---	
Gist	loblolly pine	105	525	blackgum, elm, loblolly pine, sweetgum, water oak
	sweetgum	105	350	
VaA:				
Vamont	loblolly pine	90	330	green ash, loblolly pine, sweetgum, water oak, white oak
	water oak	75	---	

Table 9.--Forestland Management

(Only soils suitable for production of trees are listed)

Map symbol and soil name	Management Concerns				
	Erosion Hazard	Equipment Limitations	Seedling Mortality	Windthrow Hazards	Plant Competition
BbA:					
Barbary	Slight	Severe	Severe	Slight	Severe
BeB:					
Bienville	Slight	Severe	Moderate	Slight	Slight
BnA:					
Bevil	Slight	Severe	Severe	Severe	Slight
BtA:					
Bienville	Slight	Severe	Moderate	Slight	Slight
Camptown	Slight	Severe	Severe	Severe	Slight
BwA:					
Bleakwood	Slight	Severe	Severe	Severe	Slight
CaA:					
Camptown	Slight	Severe	Severe	Severe	Slight
CrA:					
Craigen	Slight	Severe	Moderate	Slight	Slight
EsA:					
Estes	Slight	Severe	Moderate	Moderate	Slight
EvA:					
Evadale	Slight	Severe	Moderate	Moderate	Slight
FaA:					
Fausse	Slight	Severe	Severe	Moderate	Severe
MmA:					
Mollco	Slight	Severe	Severe	Severe	Severe
MoA:					
Mollco	Slight	Severe	Severe	Severe	Severe
Craigen	Slight	Severe	Moderate	Slight	Slight
SpA:					
Spurger	Slight	Moderate	Slight	Moderate	Slight
StA:					
Spurger	Slight	Moderate	Slight	Moderate	Slight
Camptown	Slight	Severe	Severe	Severe	Slight
TaA:					
Texla	Slight	Moderate	Slight	Moderate	Slight
Evadale	Slight	Severe	Moderate	Moderate	Slight
TeB:					
Texla	Slight	Moderate	Slight	Moderate	Slight
Evadale	Slight	Severe	Moderate	Moderate	Slight

Table 9.--Forestland Management

Map symbol and soil name	Management Concerns				
	Erosion Hazard	Equipment Limitations	Seedling Mortality	Windthrow Hazards	Plant Competition
TgA:					
Texla	Slight	Moderate	Slight	Moderate	Slight
Gist	Slight	Slight	Slight	Slight	Slight
Evadale	Slight	Severe	Moderate	Moderate	Slight
VaA:					
Vamont	Slight	Severe	Severe	Moderate	Slight

Table 10.--Recreational Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AmA:					
Allemands	Severe: flooding percs slowly ponding	Severe: excess humus percs slowly ponding	Severe: excess humus flooding ponding	Severe: excess humus ponding	Severe: excess humus flooding ponding
AnA:					
Anahuac	Severe: percs slowly	Severe: percs slowly	Severe: percs slowly	Slight	Slight
AsA:					
Anahuac	Severe: percs slowly	Severe: percs slowly	Severe: percs slowly	Slight	Slight
Aris	Severe: flooding percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
AuA:					
Anahuac	Severe: percs slowly	Severe: percs slowly	Severe: percs slowly	Slight	Slight
Urban Land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
BaA:					
Bancker	Severe: flooding percs slowly ponding	Severe: percs slowly ponding	Severe: flooding ponding	Severe: ponding	Severe: flooding ponding
BbA:					
Barbary	Severe: flooding percs slowly ponding	Severe: percs slowly too clayey ponding	Severe: flooding too clayey ponding	Severe: too clayey ponding	Severe: flooding too clayey ponding
BcA:					
Barnett	Severe: flooding percs slowly wetness	Severe: excess humus percs slowly wetness	Severe: excess humus flooding wetness	Severe: excess humus wetness	Severe: excess humus flooding wetness
BeA:					
Barnett	Severe: flooding percs slowly wetness	Severe: excess salt percs slowly wetness	Severe: flooding percs slowly wetness	Severe: wetness	Severe: excess salt flooding wetness
Bh:					
Beaches	Severe: flooding too sandy wetness	Severe: excess salt too sandy wetness	Severe: flooding too sandy wetness	Severe: too sandy wetness	Severe: excess salt wetness droughty

Table 10.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
BmA:					
Beaumont	Severe: percs slowly too clayey wetness	Severe: too clayey wetness too acid	Severe: percs slowly too clayey wetness	Severe: too clayey wetness	Severe: too clayey wetness too acid
BnA:					
Bevil	Severe: percs slowly too clayey wetness	Severe: too clayey wetness too acid	Severe: percs slowly too clayey wetness	Severe: too clayey wetness	Severe: too clayey wetness too acid
BsB:					
Bienville	Moderate: too sandy	Moderate: too sandy	Moderate: slope too sandy	Moderate: too sandy	Moderate: droughty
BtA:					
Bienville	Moderate: too sandy	Moderate: too sandy	Moderate: too sandy	Moderate: too sandy	Moderate: droughty
Camptown	Severe: too acid ponding	Severe: too acid ponding	Severe: too acid ponding	Severe: ponding	Severe: too acid ponding
BwA:					
Bleakwood	Severe: flooding wetness	Severe: wetness	Severe: flooding wetness	Severe: wetness	Severe: flooding wetness
CaA:					
Camptown	Severe: too acid ponding	Severe: too acid ponding	Severe: too acid ponding	Severe: ponding	Severe: too acid ponding
CeA:					
Caplen	Severe: flooding percs slowly ponding	Severe: percs slowly ponding	Severe: flooding ponding	Severe: ponding	Severe: flooding ponding
ChA:					
China	Severe: percs slowly too clayey wetness	Severe: too clayey wetness too acid	Severe: percs slowly too clayey wetness	Severe: too clayey wetness	Severe: too clayey wetness too acid
CrA:					
Craigen	Severe: too acid	Severe: too acid	Severe: too acid	Moderate: too sandy	Severe: too acid
CsA:					
Creole	Severe: flooding percs slowly ponding	Severe: excess salt ponding	Severe: flooding ponding	Severe: ponding	Severe: excess salt flooding ponding
EsA:					
Estes	Severe: flooding percs slowly wetness	Severe: percs slowly too clayey wetness	Severe: flooding too clayey wetness	Severe: too clayey wetness	Severe: flooding too clayey wetness

Table 10.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
EvA:					
Evadale	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
FaA:					
Fausse	Severe: flooding percs slowly ponding	Severe: percs slowly too clayey ponding	Severe: flooding too clayey ponding	Severe: too clayey ponding	Severe: flooding too clayey ponding
FrA:					
Franeau	Severe: flooding percs slowly wetness	Severe: percs slowly too clayey wetness	Severe: percs slowly too clayey wetness	Severe: too clayey wetness	Severe: too clayey wetness
HaA:					
Harris	Severe: flooding percs slowly wetness	Severe: excess salt too clayey wetness	Severe: flooding too clayey wetness	Severe: too clayey wetness	Severe: excess salt wetness droughty
ImA:					
Ijam	Severe: flooding percs slowly wetness	Severe: excess salt too clayey wetness	Severe: flooding wetness	Severe: too clayey wetness	Severe: excess salt flooding wetness
LaA:					
Labelle	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
LbA:					
Labelle	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
Anahuac	Severe: percs slowly	Severe: percs slowly	Severe: percs slowly	Slight	Slight
LcA:					
Labelle	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
Aris	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
LdA:					
Labelle	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
Levac	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness

Table 10.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
LeA:					
Labelle	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
Urban Land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
LmA:					
Larose	Severe: flooding percs slowly ponding	Severe: percs slowly ponding	Severe: flooding ponding	Severe: ponding	Severe: flooding ponding
LtA:					
League	Severe: percs slowly too clayey wetness	Severe: too clayey wetness too acid	Severe: percs slowly too clayey wetness	Severe: too clayey wetness	Severe: too clayey wetness too acid
LuA:					
League	Severe: percs slowly too clayey wetness	Severe: too clayey wetness too acid	Severe: percs slowly too clayey wetness	Severe: too clayey wetness	Severe: too clayey wetness too acid
Urban Land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
LvA:					
Leerco	Severe: flooding percs slowly ponding	Severe: excess humus percs slowly ponding	Severe: excess humus flooding ponding	Severe: excess humus ponding	Severe: excess humus flooding ponding
LwA:					
Leton	Severe: flooding wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
McA:					
Meaton	Severe: flooding wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
Levac	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
MeA:					
Meaton	Severe: flooding wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
Spindletop	Severe: percs slowly	Severe: percs slowly	Severe: percs slowly	Moderate: wetness	Moderate: wetness
MmA:					
Mollco	Severe: flooding too acid ponding	Severe: too acid ponding	Severe: flooding too acid ponding	Severe: ponding	Severe: flooding too acid ponding

Table 10.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
MoA:					
Mollco	Severe: flooding too acid ponding	Severe: too acid ponding	Severe: flooding too acid ponding	Severe: ponding	Severe: flooding too acid ponding
Craigen	Severe: too acid	Severe: too acid	Severe: too acid	Moderate: too sandy	Severe: too acid
MrA:					
Morey	Moderate: percs slowly wetness	Moderate: percs slowly wetness	Moderate: percs slowly wetness	Moderate: wetness	Moderate: wetness
Levac	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
MsA:					
Morey	Moderate: percs slowly wetness	Moderate: percs slowly wetness	Moderate: percs slowly wetness	Moderate: wetness	Moderate: wetness
Spindletop	Severe: percs slowly	Severe: percs slowly	Severe: percs slowly	Moderate: wetness	Moderate: wetness
NcC:					
Neches	Severe: too sandy	Severe: too sandy	Severe: too sandy	Severe: too sandy	Severe: too sandy droughty
NeA:					
Neel	Severe: flooding percs slowly too clayey	Severe: percs slowly too clayey	Severe: percs slowly too clayey	Severe: too clayey	Severe: too clayey
NuC:					
Neel	Severe: flooding percs slowly too clayey	Severe: percs slowly too clayey	Severe: percs slowly too clayey	Severe: too clayey	Severe: too clayey
Urban Land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
OaB:					
Orcadia	Severe: wetness too acid	Severe: wetness too acid	Severe: wetness too acid	Severe: wetness	Severe: wetness too acid
OcA:					
Orcadia	Severe: wetness too acid	Severe: wetness too acid	Severe: wetness too acid	Severe: wetness	Severe: wetness too acid
Anahuac	Severe: percs slowly	Severe: percs slowly	Severe: percs slowly	Slight	Slight

Table 10.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
OsA:					
Orcadia	Severe: wetness too acid	Severe: wetness too acid	Severe: wetness too acid	Severe: wetness	Severe: wetness too acid
Aris	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
OuA:					
Orcadia	Severe: wetness too acid	Severe: wetness too acid	Severe: wetness too acid	Severe: wetness	Severe: wetness too acid
Urban Land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
Ow:					
Oil Wasteland	Severe: excess salt flooding	Severe: excess salt	Severe: excess salt	Slight	Severe: excess salt
Ps:					
Pits, Sand	Slight	Slight	Moderate: slope	Slight	Severe: droughty
SbA:					
Sabine	Severe: flooding	Moderate: too sandy	Moderate: flooding too sandy	Moderate: too sandy	Moderate: flooding droughty
Baines	Severe: flooding percs slowly ponding	Severe: percs slowly too clayey ponding	Severe: flooding too clayey ponding	Severe: too clayey ponding	Severe: flooding too clayey ponding
ScA:					
Scatlake	Severe: flooding percs slowly ponding	Severe: excess salt too clayey ponding	Severe: flooding too clayey ponding	Severe: too clayey ponding	Severe: excess salt flooding ponding
SpA:					
Spurger	Moderate: percs slowly	Moderate: percs slowly	Moderate: percs slowly	Severe: erodes easily	Slight
StA:					
Spurger	Moderate: percs slowly	Moderate: percs slowly	Moderate: percs slowly	Severe: erodes easily	Slight
Camptown	Severe: too acid ponding	Severe: too acid ponding	Severe: too acid ponding	Severe: ponding	Severe: too acid ponding
TaA:					
Texla	Severe: percs slowly wetness too acid	Severe: percs slowly wetness too acid	Severe: percs slowly wetness too acid	Severe: wetness	Severe: wetness too acid

Table 10.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
TeB:					
Texla	Severe: percs slowly wetness too acid	Severe: percs slowly wetness too acid	Severe: percs slowly wetness too acid	Severe: wetness	Severe: wetness too acid
Evadale	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
TgA:					
Texla	Severe: percs slowly wetness too acid	Severe: percs slowly wetness too acid	Severe: percs slowly wetness too acid	Severe: wetness	Severe: wetness too acid
Gist	Moderate: wetness	Moderate: wetness	Moderate: wetness	Slight	Slight
VaA:					
Vamont	Severe: percs slowly too clayey wetness	Severe: percs slowly too clayey wetness	Severe: percs slowly too clayey wetness	Severe: too clayey wetness	Severe: too clayey wetness
VeA:					
Veston	Severe: flooding percs slowly wetness	Severe: percs slowly wetness	Severe: flooding percs slowly wetness	Severe: wetness	Severe: flooding wetness droughty
VtA:					
Viterbo	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
ZuA:					
Zummo	Severe: flooding ponding	Severe: excess humus ponding	Severe: excess humus ponding	Severe: excess humus ponding	Severe: flooding ponding

Table 11.--Wildlife Habitat

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	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	Rangeland wildlife
AmA:												
Allemands	Very poor	Very poor	Very poor	Very poor	---	---	Good	Very poor	Very poor	Very poor	Good	---
AnA:												
Anahuac	Fair	Good	Good	Good	Good	Fair	Fair	Fair	Good	Good	Fair	Fair
AsA:												
Anahuac	Fair	Good	Good	Good	Good	Fair	Fair	Fair	Good	Good	Fair	Fair
Aris	Fair	Fair	Good	Fair	Fair	---	Good	Good	Fair	Fair	Good	---
AuA:												
Anahuac	Fair	Good	Good	Good	Good	Fair	Fair	Fair	Good	Good	Fair	Fair
Urban Land	---	---	---	---	---	---	---	---	---	---	---	---
BaA:												
Bancker	Very poor	Very poor	Very poor	Very poor	---	---	Good	Good	Very poor	Very poor	Good	---
BbA:												
Barbary	Very poor	Very poor	Very poor	Very poor	---	Poor	Fair	Poor	Very poor	Very poor	Fair	---
BcA:												
Barnett	Very poor	Very poor	Poor	---	---	Very poor	Good	Good	Poor	---	Good	Very poor
BeA:												
Barnett	Very poor	Very poor	Poor	---	---	Very poor	Good	Good	Poor	---	Good	Very poor
Bh:												
Beaches	Very poor	Very poor	Very poor	---	---	Very poor	Poor	Poor	Very poor	---	Poor	Very poor
BmA:												
Beaumont	Fair	Fair	Poor	Fair	Fair	---	Fair	Good	Fair	Fair	Fair	---

Table 11.--Wildlife Habitat--Continued

Map symbol and soil name	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	Rangeland wildlife
BnA:												
Bevil	Fair	Fair	Poor	Fair	Fair	---	Fair	Good	Fair	Fair	Fair	---
BsB:												
Bienville	Fair	Fair	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	---
BtA:												
Bienville	Fair	Fair	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	---
Camptown	---	---	---	---	---	---	---	---	---	---	---	---
BwA:												
Bleakwood	Poor	Fair	Fair	Good	---	---	Good	Fair	Fair	Good	Fair	---
CaA:												
Camptown	---	---	---	---	---	---	---	---	---	---	---	---
CeA:												
Caplen	---	---	---	---	---	---	---	---	---	---	---	---
ChA:												
China	Fair	Fair	Fair	Good	---	Fair	Poor	Fair	Fair	---	Poor	---
CrA:												
Craigen	Poor	Fair	Good	Good	Good	---	Poor	Poor	Poor	Good	Poor	---
CsA:												
Creole	Very poor	Very poor	Very poor	---	---	Very poor	Fair	Good	Very poor	Very poor	Fair	Very poor
EsA:												
Estes	Very poor	Poor	Fair	Good	---	Fair	Fair	Fair	Poor	Fair	Fair	---
EvA:												
Evadale	Poor	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good	---
FaA:												
Fausse	Very poor	Very poor	Very poor	Poor	---	Poor	Good	Good	Very poor	Poor	Good	---

Table 11.--Wildlife Habitat--Continued

Map symbol and soil name	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	Rangeland wildlife
FrA:												
Franeau	Poor	Fair	Fair	---	---	Fair	Poor	Good	Poor	---	Fair	Fair
HaA:												
Harris	Very poor	Very poor	Poor	---	---	Very poor	Good	Good	Very poor	---	Good	Very poor
ImA:												
Ijam	Very poor	Very poor	Poor	Very poor	Very poor	---	Good	Good	Very poor	Very poor	Good	---
LaA:												
Labelle	Fair	Good	Fair	Fair	---	Fair	Fair	Fair	Fair	---	Fair	Good
LbA:												
Labelle	Fair	Good	Fair	Fair	---	Fair	Fair	Fair	Fair	---	Fair	Good
Anahuac	Fair	Good	Good	Good	Good	Fair	Fair	Fair	Good	Good	Fair	Fair
LcA:												
Labelle	Fair	Good	Fair	Fair	---	Fair	Fair	Fair	Fair	---	Fair	Good
Aris	Fair	Fair	Good	Fair	Fair	---	Good	Good	Fair	Fair	Good	---
LdA:												
Labelle	Fair	Good	Fair	Fair	---	Fair	Fair	Fair	Fair	---	Fair	Good
Levac	Fair	Good	Fair	---	---	Fair	Fair	Fair	Fair	---	Fair	Good
LeA:												
Labelle	Fair	Good	Fair	Fair	---	Fair	Fair	Fair	Fair	---	Fair	Good
Urban Land	---	---	---	---	---	---	---	---	---	---	---	---
LmA:												
Larose	Very poor	Very poor	Very poor	Very poor	---	---	Good	Good	Very poor	Very poor	Good	---
LtA:												
League	Fair	Fair	Fair	Good	---	Fair	Poor	Fair	Fair	---	Fair	Fair

Table 11.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
LuA:												
League	Fair	Fair	Fair	Good	---	Fair	Poor	Fair	Fair	---	Fair	Fair
Urban Land	---	---	---	---	---	---	---	---	---	---	---	---
LvA:												
Leerco	---	---	---	---	---	---	---	---	---	---	---	---
LwA:												
Leton	Poor	Fair	Fair	---	---	Fair	Good	Good	Fair	---	Good	Fair
McA:												
Meaton	Fair	Good	Fair	Fair	---	Fair	Fair	Fair	Fair	---	Fair	Good
Levac	Fair	Good	Fair	---	---	Fair	Fair	Fair	Fair	---	Fair	Good
MeA:												
Meaton	Fair	Good	Fair	Fair	---	Fair	Fair	Fair	Fair	---	Fair	Good
Spindletop	Good	Good	Good	---	---	Good	Poor	Poor	Good	Poor	Poor	Good
MmA:												
Mollco	---	---	---	---	---	---	---	---	---	---	---	---
MoA:												
Mollco	---	---	---	---	---	---	---	---	---	---	---	---
Craigen	Poor	Fair	Good	Good	Good	---	Poor	Poor	Poor	Good	Poor	---
MrA:												
Morey	Fair	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good	---
Levac	Fair	Good	Fair	---	---	Fair	Fair	Fair	Fair	---	Fair	Good
MsA:												
Morey	Fair	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good	---
Spindletop	Good	Good	Good	---	---	Good	Poor	Poor	Good	Poor	Poor	Good
NcC:												
Neches	Very poor	Poor	Good	Good	---	---	Very poor	Very poor	Poor	---	Very poor	Poor

Table 11.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
NeA:												
Neel	Very poor	Very poor	Poor	Very poor	Very poor	---	Poor	Poor	Very poor	Very poor	Poor	---
NuC:												
Neel	Very poor	Very poor	Poor	Very poor	Very poor	---	Poor	Poor	Very poor	Very poor	Poor	---
Urban Land	---	---	---	---	---	---	---	---	---	---	---	---
OaB:												
Orcadia	Fair	Good	Fair	Fair	---	Fair	Fair	Fair	Fair	Fair	Fair	Good
OcA:												
Orcadia	Fair	Good	Fair	Fair	---	Fair	Fair	Fair	Fair	Fair	Fair	Good
Anahuac	Fair	Good	Good	Good	Good	Fair	Fair	Fair	Good	Good	Fair	Fair
OsA:												
Orcadia	Fair	Good	Fair	Fair	---	Fair	Fair	Fair	Fair	Fair	Fair	Good
Aris	Fair	Fair	Good	Fair	Fair	---	Good	Good	Fair	Fair	Good	---
OuA:												
Orcadia	Fair	Good	Fair	Fair	---	Fair	Fair	Fair	Fair	Fair	Fair	Good
Urban Land	---	---	---	---	---	---	---	---	---	---	---	---
Ow:												
Oil Wasteland	Very poor	Very poor	Very poor	---	---	Very poor	Very poor	Very poor	Very poor	---	Very poor	Very poor
Ps:												
Pits, Sand	Very poor	Very poor	Very poor	---	---	Very poor	Very poor	Very poor	Very poor	---	Very poor	Very poor
SbA:												
Sabine	Poor	Fair	Fair	---	---	Fair	Very poor	Fair	Fair	---	Poor	Fair
Baines	---	---	---	---	---	---	---	---	---	---	---	---

Table 11.--Wildlife Habitat--Continued

Map symbol and soil name	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	Rangeland wildlife
ScA:												
Scatlake	Very poor	Very poor	Very poor	Very poor	---	---	Good	Good	Very poor	Very poor	Good	---
SpA:												
Spurger	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
StA:												
Spurger	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
Camptown	---	---	---	---	---	---	---	---	---	---	---	---
TaA:												
Texla	Fair	Good	Good	Good	Good	---	Fair	Fair	Fair	Good	Fair	---
TeB:												
Texla	Fair	Good	Good	Good	Good	---	Fair	Fair	Fair	Good	Fair	---
Evadale	Poor	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good	---
TgA:												
Texla	Fair	Good	Good	Good	Good	---	Fair	Fair	Fair	Good	Fair	---
Gist	Good	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
VaA:												
Vamont	Fair	Fair	Fair	Good	Good	---	Fair	Fair	Fair	Good	Fair	---
VeA:												
Veston	Very poor	Fair	Poor	---	---	Poor	Good	Good	Poor	---	Good	Poor
VtA:												
Viterbo	Fair	Good	Fair	Fair	---	Fair	Good	Fair	Fair	---	Fair	Good
ZuA:												
Zummo	---	---	---	---	---	---	---	---	---	---	---	---

Table 12.--Building Site Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AmA:						
Allemands	Severe: excess humus ponding	Severe: flooding subsides ponding	Severe: flooding subsides ponding	Severe: flooding subsides ponding	Severe: flooding subsides ponding	Severe: excess humus flooding ponding
AnA:						
Anahuac	Moderate: too clayey wetness	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
AsA:						
Anahuac	Moderate: too clayey wetness	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
Aris	Severe: wetness	Severe: flooding shrink-swell wetness	Severe: flooding shrink-swell wetness	Severe: flooding shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness
AuA:						
Anahuac	Moderate: too clayey wetness	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
Urban Land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
BaA:						
Bancker	Severe: excess humus ponding	Severe: flooding low strength ponding	Severe: flooding low strength ponding	Severe: flooding low strength ponding	Severe: flooding low strength ponding	Severe: flooding ponding
BbA:						
Barbary	Severe: excess humus ponding	Severe: flooding low strength ponding	Severe: flooding low strength ponding	Severe: flooding low strength ponding	Severe: flooding low strength ponding	Severe: flooding too clayey ponding

Table 12.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
BcA:						
Barnett	Severe: wetness	Severe: flooding shrink-swell wetness	Severe: flooding shrink-swell wetness	Severe: flooding shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: excess humus flooding wetness
BeA:						
Barnett	Severe: wetness	Severe: flooding shrink-swell wetness	Severe: flooding shrink-swell wetness	Severe: flooding shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: excess salt flooding wetness
Bh:						
Beaches	Severe: wetness cutbanks cave	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: excess salt wetness droughty
BmA:						
Beaumont	Severe: wetness cutbanks cave	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: too clayey wetness too acid
BnA:						
Bevil	Severe: wetness cutbanks cave	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: too clayey wetness too acid
BsB:						
Bienville	Severe: cutbanks cave	Slight	Moderate: wetness	Slight	Slight	Moderate: droughty
BtA:						
Bienville	Severe: cutbanks cave	Slight	Moderate: wetness	Slight	Slight	Moderate: droughty
Camptown	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: low strength ponding	Severe: too acid ponding
BwA:						
Bleakwood	Severe: wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness

Table 12.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
CaA:						
Camptown	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: low strength ponding	Severe: too acid ponding
CeA:						
Caplen	Severe: ponding	Severe: flooding ponding	Severe: flooding ponding	Severe: flooding ponding	Severe: flooding low strength ponding	Severe: flooding ponding
ChA:						
China	Severe: wetness cutbanks cave	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: too clayey wetness too acid
CrA:						
Craigen	Severe: cutbanks cave	Slight	Moderate: wetness	Slight	Slight	Severe: too acid
CsA:						
Creole	Severe: ponding cutbanks cave	Severe: flooding shrink-swell ponding	Severe: flooding shrink-swell ponding	Severe: flooding shrink-swell ponding	Severe: low strength shrink-swell ponding	Severe: excess salt flooding ponding
EsA:						
Estes	Severe: wetness cutbanks cave	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding low strength wetness	Severe: flooding too clayey wetness
EvA:						
Evadale	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness
FaA:						
Fausse	Severe: ponding	Severe: flooding shrink-swell ponding	Severe: flooding shrink-swell ponding	Severe: flooding shrink-swell ponding	Severe: low strength shrink-swell ponding	Severe: flooding too clayey ponding

Table 12.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
FrA:						
Franeau	Severe: wetness cutbanks cave	Severe: flooding shrink-swell wetness	Severe: flooding shrink-swell wetness	Severe: flooding shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: too clayey wetness
HaA:						
Harris	Severe: wetness	Severe: flooding shrink-swell wetness	Severe: flooding shrink-swell wetness	Severe: flooding shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: excess salt wetness droughty
ImA:						
Ijam	Severe: wetness	Severe: flooding shrink-swell wetness	Severe: flooding shrink-swell wetness	Severe: flooding shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: excess salt flooding wetness
LaA:						
Labelle	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness
LbA:						
Labelle	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness
Anahuac	Moderate: too clayey wetness	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
LcA:						
Labelle	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness
Aris	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness

Table 12.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
LdA:						
Labelle	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness
Levac	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness
LeA:						
Labelle	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness
Urban Land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
LmA:						
Larose	Severe: ponding	Severe: flooding ponding	Severe: flooding ponding	Severe: flooding ponding	Severe: flooding low strength ponding	Severe: flooding ponding
LtA:						
League	Severe: wetness cutbanks cave	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: too clayey wetness too acid
LuA:						
League	Severe: wetness cutbanks cave	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: too clayey wetness too acid
Urban Land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
LvA:						
Leerco	Severe: ponding	Severe: flooding shrink-swell ponding	Severe: flooding shrink-swell ponding	Severe: flooding shrink-swell ponding	Severe: low strength shrink-swell ponding	Severe: excess humus flooding ponding

Table 12.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
LwA:						
Leton	Severe: wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding low strength wetness	Severe: wetness
McA:						
Meaton	Severe: wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding low strength wetness	Severe: wetness
Levac	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness
MeA:						
Meaton	Severe: wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding low strength wetness	Severe: wetness
Spindletop	Severe: wetness	Moderate: wetness	Severe: shrink-swell wetness	Moderate: wetness	Moderate: wetness	Moderate: wetness
MmA:						
Mollco	Severe: ponding	Severe: flooding ponding	Severe: flooding ponding	Severe: flooding ponding	Severe: flooding ponding	Severe: flooding too acid ponding
MoA:						
Mollco	Severe: ponding	Severe: flooding ponding	Severe: flooding ponding	Severe: flooding ponding	Severe: flooding ponding	Severe: flooding too acid ponding
Craigen	Severe: cutbanks cave	Slight	Moderate: wetness	Slight	Slight	Severe: too acid
MrA:						
Morey	Severe: wetness	Moderate: shrink-swell wetness	Severe: wetness	Moderate: shrink-swell wetness	Severe: low strength	Moderate: wetness

Table 12.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Levac	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness
MsA:						
Morey	Severe: wetness	Moderate: shrink-swell wetness	Severe: wetness	Moderate: shrink-swell wetness	Severe: low strength	Moderate: wetness
Spindletop	Severe: wetness	Moderate: wetness	Severe: shrink-swell wetness	Moderate: wetness	Moderate: wetness	Moderate: wetness
NcC:						
Neches	Severe: cutbanks cave	Slight	Slight	Slight	Slight	Severe: too sandy droughty
NeA:						
Neel	Moderate: too clayey wetness	Severe: flooding shrink-swell	Severe: flooding shrink-swell	Severe: flooding shrink-swell	Severe: low strength shrink-swell	Severe: too clayey
NuC:						
Neel	Moderate: too clayey wetness	Severe: flooding shrink-swell	Severe: flooding shrink-swell	Severe: flooding shrink-swell	Severe: low strength shrink-swell	Severe: too clayey
Urban Land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
OaB:						
Orcadia	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness too acid
OcA:						
Orcadia	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness too acid
Anahuac	Moderate: too clayey wetness	Severe: shrink-swell	Severe: shrink-swell	Severe: shrink-swell	Severe: low strength shrink-swell	Slight

Table 12.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
OsA:						
Orcadia	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness too acid
Aris	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness
OuA:						
Orcadia	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness too acid
Urban Land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
Ow:						
Oil Wasteland	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Severe: excess salt
Ps:						
Pits, Sand	Slight	Slight	Slight	Moderate: slope	Slight	Severe: droughty
SbA:						
Sabine	Severe: cutbanks cave	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Moderate: flooding droughty
Baines	Severe: ponding cutbanks cave	Severe: flooding shrink-swell ponding	Severe: flooding ponding	Severe: flooding shrink-swell ponding	Severe: low strength shrink-swell ponding	Severe: flooding too clayey ponding
ScA:						
Scatlake	Severe: excess humus ponding	Severe: flooding low strength ponding	Severe: flooding low strength ponding	Severe: flooding low strength ponding	Severe: flooding low strength ponding	Severe: excess salt flooding ponding
SpA:						
Spurger	Moderate: too clayey wetness	Moderate: shrink-swell	Moderate: shrink-swell wetness	Moderate: shrink-swell	Severe: low strength	Slight

Table 12.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
StA:						
Spurger	Moderate: too clayey wetness	Moderate: shrink-swell	Moderate: shrink-swell wetness	Moderate: shrink-swell	Severe: low strength	Slight
Camptown	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: low strength ponding	Severe: too acid ponding
TaA:						
Texla	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness too acid
TeB:						
Texla	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness too acid
Evadale	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness
TgA:						
Texla	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness too acid
Gist	Severe: wetness	Moderate: wetness	Severe: wetness	Moderate: wetness	Moderate: wetness	Slight
VaA:						
Vamont	Severe: wetness cutbanks cave	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: too clayey wetness
VeA:						
Veston	Severe: wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding low strength wetness	Severe: flooding wetness droughty

Table 12. --Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
VtA:						
Viterbo	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: low strength wetness	Severe: wetness
ZuA:						
Zummo	Severe: ponding	Severe: flooding shrink-swell ponding	Severe: flooding ponding	Severe: flooding shrink-swell ponding	Severe: low strength shrink-swell ponding	Severe: flooding ponding

Table 13.--Sanitary Facilities

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AmA:					
Allemands	Severe: flooding percs slowly ponding	Severe: excess humus flooding seepage	Severe: excess humus flooding ponding	Severe: flooding seepage ponding	Poor: excess humus ponding
AnA:					
Anahuac	Severe: percs slowly	Moderate: seepage	Severe: too clayey wetness	Moderate: wetness	Poor: hard to pack too clayey
AsA:					
Anahuac	Severe: percs slowly	Moderate: seepage	Severe: too clayey wetness	Moderate: wetness	Poor: hard to pack too clayey
Aris	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
AuA:					
Anahuac	Severe: percs slowly	Moderate: seepage	Severe: too clayey wetness	Moderate: wetness	Poor: hard to pack too clayey
Urban Land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
BaA:					
Bancker	Severe: flooding percs slowly ponding	Severe: excess humus flooding ponding	Severe: flooding too clayey ponding	Severe: flooding ponding	Poor: hard to pack too clayey ponding
BbA:					
Barbary	Severe: flooding percs slowly ponding	Severe: flooding ponding	Severe: flooding too clayey ponding	Severe: flooding ponding	Poor: hard to pack too clayey ponding
BcA:					
Barnett	Severe: flooding percs slowly wetness	Severe: excess humus flooding	Severe: flooding too clayey wetness	Severe: flooding wetness	Poor: hard to pack too clayey wetness
BeA:					
Barnett	Severe: flooding percs slowly wetness	Severe: flooding	Severe: flooding too clayey wetness	Severe: flooding wetness	Poor: hard to pack too clayey wetness
Bh:					
Beaches	Severe: flooding wetness poor filter	Severe: flooding seepage wetness	Severe: flooding seepage wetness	Severe: flooding seepage wetness	Poor: seepage too sandy wetness

Table 13.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
BmA:					
Beaumont	Severe: percs slowly wetness	Slight	Severe: too clayey wetness too acid	Severe: wetness	Poor: hard to pack too clayey wetness
BnA:					
Bevil	Severe: percs slowly wetness	Slight	Severe: too clayey wetness too acid	Severe: wetness	Poor: hard to pack too clayey wetness
BsB:					
Bienville	Moderate: wetness	Severe: seepage	Severe: seepage too sandy wetness	Severe: seepage	Poor: too sandy
BtA:					
Bienville	Moderate: wetness	Severe: seepage	Severe: seepage too sandy wetness	Severe: seepage	Poor: too sandy
Camptown	Severe: percs slowly ponding	Severe: ponding	Severe: too acid ponding	Severe: ponding	Poor: too acid ponding
BwA:					
Bleakwood	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Poor: wetness
CaA:					
Camptown	Severe: percs slowly ponding	Severe: ponding	Severe: too acid ponding	Severe: ponding	Poor: too acid ponding
CeA:					
Caplen	Severe: flooding percs slowly ponding	Severe: excess humus flooding ponding	Severe: flooding too clayey ponding	Severe: flooding ponding	Poor: hard to pack too clayey ponding
ChA:					
China	Severe: percs slowly wetness	Slight	Severe: too clayey wetness too acid	Severe: wetness	Poor: hard to pack too clayey wetness
CrA:					
Craigen	Severe: wetness poor filter	Severe: seepage	Severe: wetness too acid	Severe: seepage	Poor: too acid
CsA:					
Creole	Severe: flooding percs slowly ponding	Severe: excess humus flooding ponding	Severe: flooding too clayey ponding	Severe: flooding ponding	Poor: hard to pack too clayey ponding

Table 13.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
EsA:					
Estes	Severe: flooding percs slowly wetness	Severe: flooding	Severe: flooding too clayey wetness	Severe: flooding wetness	Poor: hard to pack too clayey wetness
EvA:					
Evadale	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
FaA:					
Fausse	Severe: flooding percs slowly ponding	Severe: flooding ponding	Severe: flooding too clayey ponding	Severe: flooding ponding	Poor: hard to pack too clayey ponding
FrA:					
Franeau	Severe: flooding percs slowly wetness	Severe: flooding	Severe: flooding too clayey wetness	Severe: flooding wetness	Poor: hard to pack too clayey wetness
HaA:					
Harris	Severe: flooding percs slowly wetness	Severe: flooding	Severe: flooding too clayey wetness	Severe: flooding wetness	Poor: hard to pack too clayey wetness
ImA:					
Ijam	Severe: flooding percs slowly wetness	Severe: flooding	Severe: flooding too clayey wetness	Severe: flooding wetness	Poor: hard to pack too clayey wetness
LaA:					
Labelle	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
LbA:					
Labelle	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
Anahuac	Severe: percs slowly	Moderate: seepage	Severe: too clayey wetness	Moderate: wetness	Poor: hard to pack too clayey
LcA:					
Labelle	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
Aris	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness

Table 13.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
LdA:					
Labelle	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
Levac	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
LeA:					
Labelle	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
Urban Land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
LmA:					
Larose	Severe: flooding percs slowly ponding	Severe: excess humus flooding ponding	Severe: flooding too clayey ponding	Severe: flooding ponding	Poor: hard to pack too clayey ponding
LtA:					
League	Severe: percs slowly wetness	Slight	Severe: too clayey wetness too acid	Severe: wetness	Poor: hard to pack too clayey wetness
LuA:					
League	Severe: percs slowly wetness	Slight	Severe: too clayey wetness too acid	Severe: wetness	Poor: hard to pack too clayey wetness
Urban Land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
LvA:					
Leerco	Severe: flooding percs slowly ponding	Severe: excess humus flooding ponding	Severe: flooding too clayey ponding	Severe: flooding ponding	Poor: hard to pack too clayey ponding
LwA:					
Leton	Severe: flooding percs slowly wetness	Severe: flooding	Severe: flooding wetness	Severe: flooding wetness	Poor: wetness
McA:					
Meaton	Severe: flooding percs slowly wetness	Severe: flooding	Severe: flooding wetness	Severe: flooding wetness	Poor: wetness
Levac	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness

Table 13.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
MeA:					
Meaton	Severe: flooding percs slowly wetness	Severe: flooding	Severe: flooding wetness	Severe: flooding wetness	Poor: wetness
Spindletop	Severe: percs slowly wetness	Moderate: seepage	Severe: too clayey wetness	Moderate: wetness	Poor: hard to pack too clayey
MmA:					
Mollco	Severe: flooding percs slowly ponding	Severe: flooding ponding	Severe: flooding too acid ponding	Severe: flooding ponding	Poor: ponding
MoA:					
Mollco	Severe: flooding percs slowly ponding	Severe: flooding ponding	Severe: flooding too acid ponding	Severe: flooding ponding	Poor: ponding
Craigen	Severe: wetness poor filter	Severe: seepage	Severe: wetness too acid	Severe: seepage	Poor: too acid
MrA:					
Morey	Severe: percs slowly wetness	Slight	Severe: wetness	Moderate: wetness	Fair: thin layer too clayey wetness
Levac	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
MsA:					
Morey	Severe: percs slowly wetness	Slight	Severe: wetness	Moderate: wetness	Fair: thin layer too clayey wetness
Spindletop	Severe: percs slowly wetness	Moderate: seepage	Severe: too clayey wetness	Moderate: wetness	Poor: hard to pack too clayey
NcC:					
Neches	Severe: percs slowly	Severe: seepage	Severe: too sandy	Slight	Poor: seepage too sandy
NeA:					
Neel	Severe: percs slowly wetness	Moderate: slope	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey
NuC:					
Neel	Severe: percs slowly wetness	Moderate: slope	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey

Table 13.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Urban Land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
OaB:					
Orcadia	Severe: percs slowly wetness	Slight	Severe: too clayey wetness too acid	Severe: wetness	Poor: hard to pack too clayey wetness
OcA:					
Orcadia	Severe: percs slowly wetness	Slight	Severe: too clayey wetness too acid	Severe: wetness	Poor: hard to pack too clayey wetness
Anahuac	Severe: percs slowly	Moderate: seepage	Severe: too clayey wetness	Moderate: wetness	Poor: hard to pack too clayey
OsA:					
Orcadia	Severe: percs slowly wetness	Slight	Severe: too clayey wetness too acid	Severe: wetness	Poor: hard to pack too clayey wetness
Aris	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
OuA:					
Orcadia	Severe: percs slowly wetness	Slight	Severe: too clayey wetness too acid	Severe: wetness	Poor: hard to pack too clayey wetness
Urban Land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
Ow:					
Oil Wasteland	Limitation: variable	Limitation: variable	Severe: excess salt	Limitation: variable	Severe: excess salt
Ps:					
Pits, Sand	Slight	Moderate: slope	Slight	Slight	Good
SbA:					
Sabine	Severe: flooding wetness poor filter	Severe: flooding seepage wetness	Severe: flooding seepage wetness	Severe: flooding seepage wetness	Poor: seepage too sandy
Baines	Severe: flooding percs slowly ponding	Severe: flooding seepage ponding	Severe: flooding seepage ponding	Severe: flooding seepage ponding	Poor: seepage too sandy ponding
ScA:					
Scatlake	Severe: flooding percs slowly ponding	Severe: flooding ponding	Severe: flooding too clayey ponding	Severe: flooding ponding	Poor: hard to pack too clayey ponding

Table 13.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
SpA:					
Spurger	Severe: percs slowly	Slight	Severe: seepage too clayey wetness	Slight	Poor: hard to pack too clayey
StA:					
Spurger	Severe: percs slowly	Slight	Severe: seepage too clayey wetness	Slight	Poor: hard to pack too clayey
Camptown	Severe: percs slowly ponding	Severe: ponding	Severe: too acid ponding	Severe: ponding	Poor: too acid ponding
TaA:					
Texla	Severe: percs slowly wetness	Moderate: seepage	Severe: too clayey wetness too acid	Severe: wetness	Poor: hard to pack too clayey wetness
TeB:					
Texla	Severe: percs slowly wetness	Moderate: seepage	Severe: too clayey wetness too acid	Severe: wetness	Poor: hard to pack too clayey wetness
Evadale	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey
TgA:					
Texla	Severe: percs slowly wetness	Moderate: seepage	Severe: too clayey wetness too acid	Severe: wetness	Poor: hard to pack too clayey wetness
Gist	Severe: percs slowly wetness	Moderate: seepage	Moderate: wetness	Moderate: wetness	Fair: thin layer wetness
VaA:					
Vamont	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
VeA:					
Veston	Severe: flooding percs slowly wetness	Severe: flooding	Severe: flooding wetness	Severe: flooding wetness	Poor: hard to pack wetness
VtA:					
Viterbo	Severe: percs slowly wetness	Moderate: seepage	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness

Table 13.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
ZuA:					
Zummo	Severe: flooding percs slowly ponding	Severe: excess humus flooding	Severe: flooding ponding	Severe: flooding ponding	Poor: hard to pack too clayey

Table 14.--Construction Materials

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
AmA:				
Allemands	Poor: wetness	Improbable: excess humus	Improbable: excess humus	Poor: excess humus wetness
AnA:				
Anahuac	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
AsA:				
Anahuac	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Aris	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
AuA:				
Anahuac	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
Urban Land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
BaA:				
Bancker	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
BbA:				
Barbary	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
BcA:				
Barnett	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: excess salt too clayey wetness
BeA:				
Barnett	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: excess salt too clayey wetness
Bh:				
Beaches	Poor: wetness	Probable	Improbable: too sandy	Poor: excess salt too sandy wetness
BmA:				
Beaumont	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness

Table 14.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
BnA:				
Bevil	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
BsB:				
Bienville	Good	Improbable: excess fines	Improbable: excess fines	Poor: too sandy
BtA:				
Bienville	Good	Improbable: excess fines	Improbable: excess fines	Poor: too sandy
Camptown	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness too acid
BwA:				
Bleakwood	Poor: wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness
CaA:				
Camptown	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness too acid
CeA:				
Caplen	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
ChA:				
China	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness too acid
CrA:				
Craigen	Good	Improbable: excess fines	Improbable: excess fines	Poor: too acid
CsA:				
Creole	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: excess salt too clayey wetness
EsA:				
Estes	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
EvA:				
Evadale	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
FaA:				
Fausse	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness

Table 14.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
FrA:				
Franeau	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
HaA:				
Harris	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: excess salt too clayey wetness
ImA:				
Ijam	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: excess salt too clayey wetness
LaA:				
Labelle	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
LbA:				
Labelle	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
Anahuac	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
LcA:				
Labelle	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
Aris	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
LdA:				
Labelle	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
Levac	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
LeA:				
Labelle	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness

Table 14.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
Urban Land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
LmA:				
Larose	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
LtA:				
League	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
LuA:				
League	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
Urban Land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
LvA:				
Leerco	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: excess salt too clayey wetness
LwA:				
Leton	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness
McA:				
Meaton	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness
Levac	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
MeA:				
Meaton	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness
Spindletop	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Fair: thin layer
MmA:				
Mollco	Poor: wetness	Improbable: excess fines	Improbable: excess fines	Poor: thin layer wetness
MoA:				
Mollco	Poor: wetness	Improbable: excess fines	Improbable: excess fines	Poor: thin layer wetness

Table 14.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
Craigen	Good	Improbable: excess fines	Improbable: excess fines	Poor: too acid
MrA:				
Morey	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
Levac	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
MsA:				
Morey	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
Spindletop	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Fair: thin layer
NcC:				
Neches	Fair: thin layer	Probable	Improbable: too sandy	Poor: too sandy
NeA:				
Neel	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: excess salt too clayey
NuC:				
Neel	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: excess salt too clayey
Urban Land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
OaB:				
Orcadia	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness too acid
OcA:				
Orcadia	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness too acid
Anahuac	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
OsA:				
Orcadia	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness too acid
Aris	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness

Table 14.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
OuA:				
Orcadia	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness too acid
Urban Land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
Ow:				
Oil Wasteland	Severe: area reclaim	Severe: excess fines	Severe: excess fines	Severe: excess salt
Ps:				
Pits, Sand	Good	Improbable: excess fines	Improbable: excess fines	Good
SbA:				
Sabine	Fair: wetness	Probable	Improbable: too sandy	Poor: too sandy
Baines	Poor: wetness	Probable	Improbable: too sandy	Poor: excess salt too clayey wetness
ScA:				
Scatlake	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: excess salt too clayey wetness
SpA:				
Spurger	Good	Probable	Improbable: too sandy	Poor: too clayey
StA:				
Spurger	Good	Probable	Improbable: too sandy	Poor: too clayey
Camptown	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness too acid
TaA:				
Texla	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
TeB:				
Texla	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
Evadale	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness

Table 14.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
TgA:				
Texla	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
Gist	Fair: thin layer wetness	Improbable: excess fines	Improbable: excess fines	Good
VaA:				
Vamont	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
VeA:				
Veston	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: excess salt wetness
VtA:				
Viterbo	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
ZuA:				
Zummo	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness too acid

Table 15.--Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
AmA:							
Allemands	Severe: seepage	Severe: excess humus ponding	Severe: slow refill	Limitation: flooding percs slowly ponding	Limitation: flooding percs slowly ponding	Limitation: ponding	Limitation: percs slowly wetness
AnA:							
Anahuac	Moderate: seepage	Severe: hard to pack	Severe: slow refill	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly
AsA:							
Anahuac	Moderate: seepage	Severe: hard to pack	Severe: slow refill	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly
Aris	Slight	Severe: wetness	Severe: no water	Limitation: percs slowly	Limitation: percs slowly wetness	Limitation: erodes easily wetness	Limitation: erodes easily percs slowly wetness
AuA:							
Anahuac	Moderate: seepage	Severe: hard to pack	Severe: slow refill	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly
Urban Land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
BaA:							
Bancker	Slight	Severe: excess humus hard to pack ponding	Severe: slow refill	Limitation: flooding percs slowly ponding	Limitation: percs slowly ponding	Limitation: percs slowly ponding	Limitation: excess salt percs slowly wetness
BbA:							
Barbary	Slight	Severe: excess humus hard to pack ponding	Severe: slow refill	Limitation: flooding percs slowly ponding	Limitation: percs slowly slow intake ponding	Limitation: percs slowly ponding	Limitation: percs slowly wetness

Table 15.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
BcA: Barnett----------------	Slight	Severe: hard to pack wetness	Severe: slow refill	Limitation: excess salt flooding percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily excess salt wetness
BeA: Barnett----------------	Slight	Severe: hard to pack wetness	Severe: slow refill	Limitation: excess salt flooding percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily excess salt wetness
Bh: Beaches----------------	Severe: seepage	Severe: excess salt seepage wetness	Severe: salty water cutbanks cave	Limitation: excess salt flooding cutbanks cave	Limitation: fast intake wetness droughty	Limitation: too sandy wetness soil blowing	Limitation: excess salt wetness droughty
BmA: Beaumont---------------	Slight	Severe: hard to pack wetness	Severe: no water	Limitation: percs slowly too acid	Limitation: percs slowly slow intake wetness	Limitation: percs slowly wetness	Limitation: percs slowly wetness
BnA: Bevil------------------	Slight	Severe: hard to pack wetness	Severe: slow refill	Limitation: percs slowly too acid	Limitation: percs slowly slow intake wetness	Limitation: percs slowly wetness	Limitation: percs slowly wetness
BsB: Bienville--------------	Severe: seepage	Severe: seepage piping	Severe: cutbanks cave	Limitation: deep to water	Limitation: fast intake droughty	Limitation: too sandy soil blowing	Limitation: droughty
BtA: Bienville--------------	Severe: seepage	Severe: seepage piping	Severe: cutbanks cave	Limitation: deep to water	Limitation: fast intake droughty	Limitation: too sandy soil blowing	Limitation: droughty
Camptown---------------	Slight	Severe: ponding	Severe: no water	Limitation: percs slowly too acid ponding	Limitation: erodes easily percs slowly ponding	Limitation: erodes easily percs slowly ponding	Limitation: erodes easily percs slowly wetness

Table 15.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	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
BwA: Bleakwood	Moderate: seepage	Severe: piping wetness	Moderate: slow refill	Limitation: flooding	Limitation: flooding wetness soil blowing	Limitation: wetness soil blowing	Limitation: wetness
CaA: Camptown	Slight	Severe: ponding	Severe: no water	Limitation: percs slowly too acid ponding	Limitation: erodes easily percs slowly ponding	Limitation: erodes easily percs slowly ponding	Limitation: erodes easily percs slowly wetness
CeA: Caplen	Slight	Severe: hard to pack ponding	Severe: slow refill	Limitation: flooding percs slowly ponding	Limitation: ponding droughty	Limitation: erodes easily percs slowly ponding	Limitation: erodes easily wetness droughty
ChA: China	Slight	Severe: hard to pack wetness	Severe: slow refill	Limitation: percs slowly too acid	Limitation: percs slowly slow intake wetness	Limitation: percs slowly wetness	Limitation: percs slowly wetness
CrA: Craigen	Severe: seepage	Severe: seepage piping	Severe: cutbanks cave	Limitation: deep to water	Limitation: fast intake soil blowing droughty	Limitation: soil blowing	Limitation: droughty
CsA: Creole	Moderate: seepage	Severe: hard to pack ponding	Severe: slow refill cutbanks cave	Limitation: flooding percs slowly ponding	Limitation: percs slowly ponding	Limitation: percs slowly ponding	Limitation: excess salt percs slowly wetness
EsA: Estes	Slight	Severe: wetness	Severe: no water	Limitation: flooding percs slowly	Limitation: percs slowly slow intake wetness	Limitation: percs slowly wetness	Limitation: percs slowly wetness

Table 15.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
EvA:							
Evadale	Slight	Severe: wetness	Severe: no water	Limitation: excess salt percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
FaA:							
Fausse	Slight	Severe: hard to pack ponding	Severe: slow refill	Limitation: flooding percs slowly ponding	Limitation: percs slowly slow intake ponding	Limitation: percs slowly ponding	Limitation: percs slowly wetness
FrA:							
Franeau	Slight	Severe: hard to pack wetness	Severe: slow refill	Limitation: excess salt flooding percs slowly	Limitation: slow intake wetness droughty	Limitation: percs slowly wetness	Limitation: percs slowly wetness droughty
HaA:							
Harris	Slight	Severe: excess salt hard to pack wetness	Severe: slow refill salty water	Limitation: excess salt flooding percs slowly	Limitation: slow intake wetness droughty	Limitation: percs slowly wetness	Limitation: excess salt wetness droughty
ImA:							
Ijam	Slight	Severe: hard to pack wetness	Severe: slow refill	Limitation: flooding percs slowly	Limitation: slow intake wetness	Limitation: percs slowly wetness	Limitation: excess salt wetness
LaA:							
Labelle	Slight	Severe: wetness	Severe: no water	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
LbA:							
Labelle	Slight	Severe: wetness	Severe: no water	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Anahuac	Moderate: seepage	Severe: hard to pack	Severe: slow refill	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly

Table 15.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
LcA:							
Labelle	Slight	Severe: wetness	Severe: no water	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Aris	Slight	Severe: wetness	Severe: no water	Limitation: percs slowly	Limitation: percs slowly wetness soil blowing	Limitation: erodes easily wetness soil blowing	Limitation: erodes easily percs slowly wetness
LdA:							
Labelle	Slight	Severe: wetness	Severe: no water	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Levac	Slight	Severe: wetness	Severe: no water	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
LeA:							
Labelle	Slight	Severe: wetness	Severe: no water	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Urban Land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
LmA:							
Larose	Slight	Severe: hard to pack ponding	Severe: slow refill	Limitation: flooding percs slowly ponding	Limitation: percs slowly ponding	Limitation: percs slowly ponding	Limitation: percs slowly wetness
LtA:							
League	Slight	Severe: hard to pack wetness	Severe: no water	Limitation: percs slowly too acid	Limitation: percs slowly slow intake wetness	Limitation: percs slowly wetness	Limitation: percs slowly wetness

Table 15.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
LuA:							
League	Slight	Severe: hard to pack wetness	Severe: no water	Limitation: percs slowly too acid	Limitation: percs slowly slow intake wetness	Limitation: percs slowly wetness	Limitation: percs slowly wetness
Urban Land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
LvA:							
Leerco	Slight	Severe: hard to pack ponding	Severe: slow refill	Limitation: flooding percs slowly ponding	Limitation: erodes easily percs slowly ponding	Limitation: erodes easily percs slowly ponding	Limitation: erodes easily percs slowly wetness
LwA:							
Leton	Moderate: seepage	Severe: wetness	Severe: slow refill	Limitation: flooding percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
McA:							
Meaton	Moderate: seepage	Severe: wetness	Severe: no water	Limitation: flooding percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Levac	Slight	Severe: wetness	Severe: no water	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
MeA:							
Meaton	Moderate: seepage	Severe: wetness	Severe: no water	Limitation: flooding percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Spindletop	Moderate: seepage	Moderate: hard to pack wetness	Severe: no water	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly

Table 15.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
MmA:							
Mollco	Slight	Severe: ponding	Severe: slow refill	Limitation: flooding too acid ponding	Limitation: flooding too acid ponding	Limitation: ponding	Limitation: wetness
MoA:							
Mollco	Slight	Severe: ponding	Severe: slow refill	Limitation: flooding too acid ponding	Limitation: flooding too acid ponding	Limitation: ponding	Limitation: wetness
Craigen	Severe: seepage	Severe: seepage piping	Severe: cutbanks cave	Limitation: deep to water	Limitation: fast intake soil blowing droughty	Limitation: soil blowing	Limitation: droughty
MrA:							
Morey	Slight	Moderate: piping wetness	Severe: no water	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly
Levac	Slight	Severe: wetness	Severe: no water	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
MsA:							
Morey	Slight	Moderate: piping wetness	Severe: no water	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly
Spindletop	Moderate: seepage	Moderate: hard to pack wetness	Severe: no water	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly
NcC:							
Neches	Severe: seepage	Severe: seepage piping	Severe: no water	Limitation: deep to water	Limitation: fast intake soil blowing droughty	Limitation: too sandy soil blowing	Limitation: droughty

Table 15.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
NeA:							
Neel	Moderate: slope	Severe: hard to pack	Severe: slow refill	Limitation: deep to water	Limitation: percs slowly slope slow intake	Limitation: percs slowly	Limitation: excess salt percs slowly
NuC:							
Neel	Moderate: slope	Severe: hard to pack	Severe: slow refill	Limitation: deep to water	Limitation: percs slowly slope slow intake	Limitation: percs slowly	Limitation: excess salt percs slowly
Urban Land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
OaB:							
Orcadia	Slight	Severe: wetness	Severe: no water	Limitation: percs slowly too acid	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
OcA:							
Orcadia	Slight	Severe: wetness	Severe: no water	Limitation: percs slowly too acid	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Anahuac	Moderate: seepage	Severe: hard to pack	Severe: slow refill	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly
OsA:							
Orcadia	Slight	Severe: wetness	Severe: no water	Limitation: percs slowly too acid	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Aris	Slight	Severe: wetness	Severe: no water	Limitation: percs slowly	Limitation: percs slowly wetness	Limitation: erodes easily wetness	Limitation: erodes easily percs slowly wetness

Table 15.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	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
OuA:							
Orcadia	Slight	Severe: wetness	Severe: no water	Limitation: percs slowly too acid	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Urban Land	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable	Limitation: variable
Ow:							
Oil Wasteland	Limitation: variable	Severe: excess salt	Severe: no water	Limitation: deep to water	Limitation: excess salt	Limitation: variable	Limitation: excess salt
Ps:							
Pits, Sand	Moderate: slope	Slight	Severe: no water	Limitation: deep to water	Limitation: excess salt slope droughty	Favorable	Limitation: excess salt droughty
SbA:							
Sabine	Severe: seepage	Severe: seepage piping	Severe: cutbanks cave	Limitation: flooding cutbanks cave	Limitation: fast intake wetness droughty	Limitation: too sandy wetness soil blowing	Limitation: droughty
Baines	Severe: seepage	Severe: seepage piping ponding	Severe: slow refill cutbanks cave	Limitation: flooding percs slowly ponding	Limitation: slow intake ponding droughty	Limitation: erodes easily too sandy ponding	Limitation: erodes easily excess salt wetness
ScA:							
Scatlake	Slight	Severe: excess humus hard to pack ponding	Severe: slow refill	Limitation: flooding percs slowly ponding	Limitation: slow intake ponding droughty	Limitation: percs slowly ponding	Limitation: excess salt wetness droughty
SpA:							
Spurger	Slight	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly	Limitation: erodes easily	Limitation: erodes easily percs slowly
StA:							
Spurger	Slight	Severe: thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly	Limitation: erodes easily	Limitation: erodes easily percs slowly

Table 15.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Camptown	Slight	Severe: ponding	Severe: no water	Limitation: percs slowly too acid ponding	Limitation: erodes easily percs slowly ponding	Limitation: erodes easily percs slowly ponding	Limitation: erodes easily percs slowly wetness
TaA:							
Texla	Moderate: seepage	Severe: wetness	Severe: no water	Limitation: percs slowly too acid	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
TeB:							
Texla	Moderate: seepage	Severe: wetness	Severe: no water	Limitation: percs slowly too acid	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Evadale	Slight	Severe: wetness	Severe: no water	Limitation: excess salt percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
TgA:							
Texla	Moderate: seepage	Severe: wetness	Severe: no water	Limitation: percs slowly too acid	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
Gist	Moderate: seepage	Severe: piping	Severe: no water	Favorable	Limitation: percs slowly wetness soil blowing	Limitation: erodes easily wetness soil blowing	Limitation: erodes easily
VaA:							
Vamont	Slight	Severe: hard to pack wetness	Severe: no water	Limitation: percs slowly	Limitation: percs slowly slow intake wetness	Limitation: percs slowly wetness	Limitation: percs slowly wetness
VeA:							
Veston	Moderate: seepage	Severe: wetness	Severe: slow refill	Limitation: excess salt flooding percs slowly	Limitation: percs slowly wetness droughty	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily excess salt wetness

Table 15.--Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
VtA:							
Viterbo	Moderate: seepage	Severe: wetness	Severe: no water	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily wetness	Limitation: erodes easily percs slowly wetness
ZuA:							
Zummo	Slight	Severe: hard to pack ponding	Severe: slow refill	Limitation: flooding percs slowly ponding	Limitation: percs slowly ponding	Limitation: percs slowly ponding	Limitation: percs slowly wetness

Table 16.--Engineering Index Properties

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
AmA:												
Allemands	0-18	Mucky peat	PT	A-8	0	0	---	---	---	---	0-14	---
	18-28	Clay, mucky clay	CH, OH	A-7	0	0	100	100	95-100	80-100	76-100	38-77
	28-80	Clay, mucky clay	CH, OH	A-7	0	0	100	100	95-100	80-100	76-100	38-77
AnA:												
Anahuac	0-7	Very fine sandy loam	CL-ML, ML	A-4	0	0	95-100	95-100	85-100	65-95	17-35	0-15
	7-18	Very fine sandy loam, loam	CL-ML, ML	A-4	0	0	95-100	95-100	85-100	65-95	17-35	0-15
	18-22	Very fine sandy loam, loam	CL-ML, ML	A-4	0	0	95-100	95-100	85-100	65-95	21-35	3-15
	22-41	Clay, silty clay	CH, CL	A-7-6	0	0	95-100	95-100	95-100	75-95	48-66	25-39
	41-54	Clay loam, clay	CH, CL	A-7-6	0	0	95-100	95-100	85-100	51-95	39-57	18-32
	54-80	Loam, sandy clay loam, clay loam	CL	A-6, A-4	0	0	95-100	95-100	85-100	75-85	28-44	9-22
AsA:												
Anahuac	0-10	Loam	CL-ML, ML	A-4	0	0	95-100	95-100	85-100	65-95	15-30	2-7
	10-19	Silt loam, very fine sandy loam, loam	CL-ML, ML	A-4	0	0	95-100	95-100	85-100	65-95	15-30	2-7
	19-24	Silt loam, very fine sandy loam, loam	CL-ML, ML	A-4	0	0	95-100	95-100	85-100	65-95	15-30	2-7
	24-45	Silty clay, clay	CH, CL	A-7	0	0	95-100	95-100	95-100	75-95	45-70	30-50
	45-52	Clay loam, clay	CL, CH	A-6, A-7	0	0	95-100	95-100	85-100	51-95	35-65	20-40
	52-80	Loam, sandy clay loam, clay loam	CL	A-6, A-4	0	0	95-100	95-100	85-100	75-85	28-44	9-22

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Aris------------	0-6	Silt loam	CL, CL-ML	A-4	0	0	98-100	95-100	95-100	60-85	21-34	4-14
	6-14	Clay loam, silty clay loam	CL	A-6, A-7-6	0	0	100	95-100	95-100	55-75	39-48	18-25
	14-23	Silty clay, clay loam, silty clay loam	CH, CL	A-7-6	0	0	100	95-100	95-100	60-80	42-62	21-36
	23-72	Clay loam, silty clay loam, clay	CH, CL	A-7-6	0	0	100	95-100	95-100	60-80	42-62	21-36
	72-80	Clay, clay loam, silty clay loam	CH, CL	A-7-6	0	0	100	95-100	95-100	60-80	41-60	20-35
AuA:												
Anahuac---------	0-7	Very fine sandy loam	CL-ML, ML	A-4	0	0	95-100	95-100	85-100	65-95	17-35	0-15
	7-18	Silt loam, very fine sandy loam, loam	CL-ML, ML	A-4	0	0	95-100	95-100	85-100	65-95	17-35	0-15
	18-22	Silt loam, very fine sandy loam, loam	CL-ML, ML	A-4	0	0	95-100	95-100	85-100	65-95	21-35	3-15
	22-41	Silty clay, clay	CH, CL	A-7-6	0	0	95-100	95-100	95-100	75-95	48-66	25-39
	41-54	Clay loam, clay	CH, CL	A-6	0	0	95-100	95-100	85-100	51-95	39-57	18-32
	54-80	Loam, sandy clay loam, clay loam	CL	A-6, A-4	0	0	95-100	95-100	85-100	75-85	28-44	9-22
Urban Land------	0-40	Variable			---	---	---	---	---	---	---	---
BaA:												
Bancker---------	0-9	Mucky peat	PT	A-8	0	0	---	---	---	---	0-14	---
	9-41	Clay, silty clay, mucky clay	MH, OH, CH	A-7	0	0	100	100	95-100	90-99	55-90	15-55
	41-80	Clay, silty clay, mucky clay	MH, OH, CH	A-7	0	0	100	100	95-100	90-99	55-90	15-55

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
BbA:												
Barbary---------	0-5	Mucky clay	MH, OH	A-8	0	0	100	100	100	95-100	70-90	35-45
	5-48	Mucky clay, clay	MH, OH, CH	A-7, A-8	0	0	100	100	100	95-100	65-90	35-45
	48-80	Clay,mucky clay	MH, OH, CH	A-7, A-8	0	0	100	100	100	95-100	65-90	35-45
BcA:												
Barnett---------	0-2	Mucky peat	PT	A-8	0	0	---	---	---	---	---	---
	2-6	Clay loam, clay	CH, CL	A-7-6	0	0	98-100	96-100	90-100	80-90	42-74	20-52
	6-22	Clay	CH, CL	A-7-6	0	0	98-100	96-100	90-100	85-95	42-74	20-52
	22-80	Clay, mucky clay	CH	A-7-6	0	0	98-100	96-100	90-100	85-95	50-81	27-55
BeA:												
Barnett---------	0-4	Silty clay loam	CL	A-7	0	0	100	95-100	95-100	55-75	39-48	18-25
	4-32	Clay	CH, CL	A-7-6	0	0	98-100	96-100	90-100	85-95	42-74	20-52
	32-80	Clay, mucky clay	CH	A-7-6	0	0	98-100	96-100	90-100	85-95	50-81	27-55
Bh:												
Beaches---------	0-80	Fine sand	SM	A-2-4	0	0	95-100	95-100	65-80	20-35	0-25	NP-4
BmA:												
Beaumont--------	0-5	Clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	53-76	33-48
	5-9	Clay, silty clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	60-76	33-48
	9-19	Clay, silty clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	60-76	33-48
	19-80	Clay, silty clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	75-90	50-65
BnA:												
Bevil-----------	0-9	Clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	60-76	33-48
	9-34	Clay, silty clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	60-76	33-48
	34-45	Clay, silty clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	60-76	33-48
	45-80	Clay, silty clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	75-90	50-65

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
BsB:												
Bienville-------	0-14	Loamy fine sand	SM	A-2-4	0	0	100	100	90-100	15-50	0-25	NP-5
	14-27	Loamy fine sand, fine sand	SM	A-2-4, A-4	0	0	100	100	90-100	15-50	0-25	NP-3
	27-62	Loamy fine sand, fine sand	SM	A-2-4, A-4	0	0	100	100	90-100	15-50	0-25	NP-3
	62-80	Loamy fine sand, fine sandy loam, fine sand	ML, SM	A-2-4, A-4	0	0	100	100	90-100	20-55	0-25	NP-3
BtA:												
Bienville-------	0-8	Loamy fine sand	SM	A-2-4	0	0	100	100	90-100	15-50	0-25	NP-5
	8-12	Loamy fine sand, fine sand	SM	A-2-4, A-4	0	0	100	100	90-100	15-50	0-25	NP-3
	12-31	Loamy fine sand, fine sand	SM	A-2-4, A-4	0	0	100	100	90-100	15-50	0-25	NP-3
	31-53	Loamy fine sand, fine sand	SM	A-2-4, A-4	0	0	100	100	90-100	15-50	0-25	NP-3
	53-80	Loamy fine sand, fine sandy loam, fine sand	ML, SM	A-2-4, A-4	0	0	100	100	90-100	20-55	0-25	NP-3
Camptown--------	0-5	Silt loam	CL, CL-ML, ML	A-4	0	0	100	95-100	90-100	75-98	16-32	3-12
	5-17	Silt loam, loam	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	90-100	75-98	16-32	3-12
	17-58	Silty clay loam, clay loam	CL	A-6	0	0	100	100	95-100	90-98	30-40	11-18
	58-80	Clay loam	CL	A-6	0	0	100	100	95-100	90-98	30-40	11-18

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
BwA:												
Bleakwood-------	0-6	Loam	CL-ML, ML, SC-SM, SM	A-4	0	0	95-100	90-100	60-85	40-75	18-28	2-9
	6-15	Loam, clay loam, fine sandy loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	90-100	80-95	45-80	20-40	5-15
	15-27	Loam, clay loam, fine sandy loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	90-100	80-95	45-80	20-40	5-15
	27-80	Loam, clay loam, fine sandy loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	95-100	90-100	80-95	45-80	20-40	5-15
CaA:												
Camptown--------	0-8	Silt loam	CL, CL-ML, ML	A-4	0	0	100	95-100	90-100	75-98	16-32	3-12
	8-14	Silt loam, loam	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	90-100	75-98	16-32	3-12
	14-40	Silty clay loam, clay loam	CL	A-6	0	0	100	100	95-100	90-98	30-40	11-18
	40-80	Clay, silty clay, silty clay loam	CH, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-65	18-40
CeA:												
Caplen----------	0-12	Mucky peat	PT	A-8	0	0	---	---	---	---	---	---
	12-37	Mucky clay, clay	MH, OH	A-7-5, A-8	0	0	100	100	100	95-100	70-90	35-45
	37-80	Clay, clay loam, sandy clay loam	CH, CL, MH, ML	A-7	0	0	100	100	90-100	90-100	40-76	15-40
ChA:												
China-----------	0-4	Clay	CH	A-7-6	0	0	100	100	95-100	90-97	60-80	30-57
	4-28	Clay	CH	A-7-6	0	0	100	95-100	95-100	90-97	60-91	35-61
	28-55	Clay	CH	A-7-6	0	0	100	95-100	95-100	80-97	60-91	35-61
	55-60	Clay	CH	A-7-6	0	0	100	95-100	95-100	85-97	60-91	35-61
	60-80	Clay	CH	A-7-6	0	0	100	95-100	95-100	85-97	60-91	35-61

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
CrA:												
Craigen	0-7	Loamy fine sand	SM	A-2-4	0	0	100	95-100	50-75	15-30	16-20	NP-4
	7-32	Loamy fine sand	SM	A-2-4	0	0	100	95-100	50-75	15-30	16-20	NP-4
	32-37	Sandy clay loam, sandy clay	SC	A-6, A-7	0	0	100	95-100	80-95	35-50	32-48	13-25
	37-49	Sandy clay loam, sandy clay	SC	A-6, A-7	0	0	100	95-100	80-95	35-50	32-48	13-25
	49-80	Fine sandy loam, sandy clay loam	SM, SC	A-4, A-6	0	0	100	95-100	70-90	35-45	26-45	4-22
CsA:												
Creole	0-7	Mucky peat	PT	A-8	0	0	---	---	---	---	---	---
	7-13	Clay, silty clay, clay loam	CH, CL	A-7-6	0	0	100	100	90-100	70-95	42-74	20-52
	13-34	Clay, silty clay, clay loam	CH, CL	A-7-6	0	0	100	100	90-100	70-95	42-74	20-52
	34-58	Clay, silty clay, clay loam	CH, CL	A-7-6	0	0	100	100	90-100	70-95	42-74	20-52
	58-80	Clay, silty clay, clay loam	CH, CL	A-7-6	0	0	100	100	90-100	70-95	42-74	20-52
EsA:												
Estes	0-4	Clay	CH, CL	A-7-6	0	0	100	100	95-100	69-100	41-55	23-35
	4-11	Clay	CH, CL	A-7-6	0	0	100	100	95-100	69-100	41-55	23-35
	11-23	Clay	CH, CL	A-7-6	0	0	100	100	95-100	69-100	41-55	23-35
	23-80	Clay	CH, CL	A-7-6	0	0	100	100	95-100	69-100	41-55	23-35

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	Percentage passing sieve number--: 10	Percentage passing sieve number--: 40	Percentage passing sieve number--: 200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
EvA:												
Evadale---------	0-5	Silt loam	CL, CL-ML, ML	A-4	0	0	100	95-100	90-100	75-100	16-31	NP-10
	5-9	Silt loam	CL, CL-ML, ML	A-4	0	0	100	95-100	90-100	75-100	16-31	NP-10
	9-22	Silty clay loam, silt loam, loam	CL	A-6	0	0	100	100	95-100	90-100	30-40	11-18
	22-55	Clay, silty clay, silty clay loam	CH, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-65	18-40
	55-80	Clay, silty clay, silty clay loam	CH, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-65	18-40
FaA:												
Fausse----------	0-6	Clay	CH	A-7-6	0	0	100	100	100	95-100	60-100	31-71
	6-14	Clay	CH	A-7-6	0	0	100	100	100	95-100	60-100	31-71
	14-68	Clay	CH	A-7-6	0	0	100	100	100	95-100	60-100	31-71
	68-80	Clay	CH	A-7-6	0	0	100	100	100	95-100	60-100	31-71
FrA:												
Franeau---------	0-16	Clay	CH	A-7-6	0	0	98-100	98-100	90-100	75-90	59-78	41-59
	16-21	Clay	CH	A-7-6	0	0	98-100	98-100	90-100	75-90	59-78	41-59
	21-27	Clay	CH	A-7-6	0	0	98-100	98-100	90-100	75-90	59-78	41-59
	27-61	Clay	CH	A-7-6	0	0	98-100	98-100	90-100	75-90	59-78	41-59
	61-80	Clay	CH	A-7-6	0	0	98-100	98-100	90-100	75-90	59-78	41-59
HaA:												
Harris----------	0-3	Clay	CH	A-7-6	0	0	98-100	85-95	70-95	70-95	65-80	40-55
	3-22	Clay	CH	A-7-6	0	0	98-100	85-95	70-95	70-95	65-80	40-55
	22-80	Clay, silty clay	CH	A-7-6	0	0	98-100	94-100	90-100	80-90	60-75	40-55
ImA:												
Ijam------------	0-6	Clay	CH, CL	A-7	0	0	98-100	90-100	90-99	70-95	45-80	25-55
	6-23	Clay	CH	A-7	0	0	100	90-100	90-100	80-98	60-85	35-55
	23-65	Clay	CH	A-7	0	0	100	90-100	90-100	80-98	60-85	35-55
	65-80	Clay	CH	A-7	0	0	100	90-100	90-100	80-98	60-85	35-55
LaA:												
Labelle---------	0-6	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	34-44	15-23
	6-12	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	85-95	46-56	25-33
	12-30	Silty clay, clay	CH	A-7	0	0	100	100	95-100	90-95	52-60	30-38
	30-80	Silty clay, clay	CH	A-7	0	0	100	100	95-100	90-95	52-60	30-38

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
LbA:												
Labelle---------	0-11	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	34-44	15-23
	11-18	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	85-95	46-56	25-33
	18-23	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	85-95	46-56	25-33
	23-80	Silty clay, clay	CH	A-7	0	0	100	100	95-100	90-95	52-60	30-38
Anahuac---------	0-10	Very fine sandy loam	CL-ML, ML	A-4	0	0	95-100	95-100	85-100	65-95	15-30	2-7
	10-20	Silt loam, very fine sandy loam, loam	CL-ML, ML	A-4	0	0	95-100	95-100	85-100	65-95	15-30	2-7
	20-26	Silt loam, very fine sandy loam, loam	CL-ML, ML	A-4	0	0	95-100	95-100	85-100	65-95	15-30	2-7
	26-56	Clay, silty clay, clay loam	CH, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-65	18-40
	56-80	Clay, silty clay, clay loam	CL, CH	A-7, A-6	0	0	100	100	95-100	90-100	35-65	18-40
LcA:												
Labelle---------	0-12	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	34-44	15-23
	12-18	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	85-95	46-56	25-33
	18-24	Silty clay, clay	CH	A-7	0	0	100	100	95-100	90-95	52-60	30-38
	24-50	Silty clay, clay	CH	A-7	0	0	100	100	95-100	90-95	52-60	30-38
	50-80	Silty clay, clay	CH	A-7	0	0	100	100	95-100	90-95	52-60	30-38
Aris------------	0-12	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	98-100	95-100	95-100	40-60	16-25	NP-7
	12-22	Sandy clay loam, clay loam, silty clay loam	CL	A-6, A-7	0	0	100	95-100	95-100	55-75	39-48	18-25
	22-34	Clay, clay loam, silty clay loam	CH, CL	A-7	0	0	100	95-100	95-100	60-80	42-62	21-36
	34-80	Clay loam, silty clay loam, clay	CH, CL	A-7	0	0	100	95-100	95-100	60-80	42-62	21-36

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
LdA:												
Labelle---------	0-9	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	34-44	15-23
	9-16	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	85-95	46-56	25-33
	16-36	Silty clay, clay	CH	A-7	0	0	100	100	95-100	90-95	52-60	30-38
	36-80	Silty clay, clay	CH	A-7	0	0	100	100	95-100	90-95	52-60	30-38
Levac-----------	0-5	Silt loam	CL	A-4	0	0	100	100	90-100	70-90	28-35	9-15
	5-18	Silt loam, silty clay loam	CL	A-6	0	0	100	100	95-100	85-95	35-43	15-21
	18-34	Silty clay, clay	CH, CL	A-7	0	0	100	100	95-100	90-95	44-57	22-32
	34-52	Silty clay, clay	CH, CL	A-7	0	0	90-100	90-100	80-100	80-95	44-57	22-32
	52-80	Silty clay, clay	CH, CL	A-7	0	0	90-100	90-100	80-100	80-95	44-57	22-32
LeA:												
Labelle---------	0-6	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	34-44	15-23
	6-12	Silty clay loam	CH, CL	A-7	0	0	100	100	95-100	85-95	46-56	25-33
	12-30	Silty clay, clay	CH	A-7	0	0	100	100	95-100	90-95	52-60	30-38
	30-80	Silty clay, clay	CH	A-7	0	0	100	100	95-100	90-95	52-60	30-38
Urban Land------	0-40	Variable			---	---	---	---	---	---	---	---
LmA:												
Larose----------	0-5	Mucky peat	PT	A-8	0	0	---	---	---	---	---	---
	5-9	Clay, silty clay, mucky clay	CH, OH	A-7	0	0	100	100	100	90-100	59-80	25-52
	9-80	Clay, silty clay, mucky clay	CH	A-7-6	0	0	100	100	100	90-100	60-87	31-58
LtA:												
League----------	0-11	Clay	CH	A-7-6	0	0	100	100	90-100	85-97	59-78	41-59
	11-30	Clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	59-78	41-59
	30-36	Clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	59-78	41-59
	36-59	Clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	59-78	41-59
	59-80	Clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	59-78	41-59

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
LuA:												
League----------	0-11	Clay	CH	A-7-6	0	0	100	100	90-100	85-97	59-78	41-59
	11-30	Clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	59-78	41-59
	30-36	Clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	59-78	41-59
	36-59	Clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	59-78	41-59
	59-80	Clay	CH	A-7-6	0	0	100	95-100	90-100	85-97	59-78	41-59
Urban Land------	0-40	Variable			---	---	---	---	---	---	---	---
LvA:												
Leerco----------	0-5	Muck	PT	A-8	0	0	---	---	---	---	0-14	---
	5-14	Silty clay, clay, mucky clay	CH	A-7-6	0	0	100	100	100	90-100	45-75	25-50
	14-26	Silty clay, clay	CH	A-7-6	0	0	100	100	100	90-100	45-75	25-50
	26-80	Silty clay, clay	CH	A-7-6	0	0	100	100	100	90-100	45-75	25-50
LwA:												
Leton-----------	0-4	Loam	CL, CL-ML, SC, SC-SM	A-4	0	0	100	98-100	95-100	45-98	21-30	5-12
	4-8	Loam	CL, CL-ML, SC, SC-SM	A-4	0	0	100	98-100	95-100	45-98	21-30	5-12
	8-20	Loam	CL, CL-ML, SC, SC-SM	A-4	0	0	100	98-100	95-100	45-98	21-30	5-12
	20-80	Clay loam, silty clay loam, sandy clay loam	CL	A-6, A-7-6	0	0	100	98-100	95-100	51-98	30-43	14-26
McA:												
Meaton----------	0-14	Silt loam	CL	A-4	0	0	100	100	90-100	65-95	28-37	9-16
	14-32	Silt loam, silty clay loam, clay loam	CL	A-4, A-6, A-7	0	0	100	100	90-100	65-95	28-43	9-21
	32-76	Silty clay loam, clay loam	CL	A-6, A-7	0	0	100	100	95-100	70-95	37-48	16-25
	76-80	Silty clay, clay	CH, CL	A-7	0	0	100	98-100	90-100	90-95	48-61	25-35

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
Levac-----------	0-7	Silt loam	CL	A-4	0	0	100	100	90-100	70-90	28-35	9-15
	7-11	Silt loam, silty clay loam	CL	A-6	0	0	100	100	95-100	85-95	35-43	15-21
	11-15	Silt loam, silty clay loam	CL	A-6	0	0	100	100	95-100	85-95	35-43	15-21
	15-26	Silty clay, clay	CH, CL	A-7	0	0	90-100	90-100	80-100	80-95	44-57	22-32
	26-80	Silty clay, clay	CH, CL	A-7	0	0	90-100	90-100	80-100	80-95	44-57	22-32
MeA:												
Meaton----------	0-12	Silt loam	CL	A-4	0	0	100	100	90-100	65-95	28-37	9-16
	12-22	Silt loam, silty clay loam, clay loam	CL	A-4, A-6, A-7	0	0	100	100	90-100	65-95	28-43	9-21
	22-37	Silt loam, silty clay loam, clay loam	CL	A-4, A-6, A-7	0	0	100	100	90-100	65-95	28-43	9-21
	37-80	Clay, silty clay, silty clay loam	CH, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-65	18-40
Spindletop------	0-12	Silt loam	CL, CL-ML, ML	A-4	0	0	100	100	95-100	75-85	15-35	NP-12
	12-28	Silt loam loam	CL, CL-ML, ML	A-4	0	0	100	100	95-100	75-85	15-35	NP-12
	28-35	Silty clay loam, silt loam, loam	CH, CL	A-7	0	0	100	100	95-100	85-95	46-56	25-33
	35-40	Silty clay loam, silt loam, loam	CH, CL	A-7	0	0	100	100	95-100	85-95	46-56	25-33
	40-80	Silty clay loam, silty clay, clay	CH	A-7	0	0	100	100	95-100	90-95	52-60	28-35

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
MmA:												
Mollco----------	0-3	Fine sandy loam	CL-ML, SC-SM, SM	A-4	0	0	100	100	70-85	40-55	16-25	NP-7
	3-16	Fine sandy loam	CL-ML, SC-SM, SM	A-4	0	0	100	100	70-85	40-55	16-25	NP-7
	16-38	Loam, sandy clay loam	CL, SC	A-4, A-6	0	0	100	100	80-95	45-70	28-40	9-20
	38-80	Loam, sandy clay loam, clay loam	CL, SC	A-6	0	0	100	100	90-100	45-80	30-40	11-20
MoA:												
Mollco----------	0-5	Fine sandy loam	CL-ML, SC-SM, SM	A-4	0	0	100	100	70-85	40-55	16-25	NP-7
	5-14	Fine sandy loam	CL-ML, SC-SM, SM	A-4	0	0	100	100	70-85	40-55	16-25	NP-7
	14-20	Fine sandy loam, sandy clay loam	SC	A-4, A-6, A-7-6	0	0	100	95-100	70-90	35-45	26-44	8-22
	20-33	Fine sandy loam, sandy clay loam, clay loam	CL, SC	A-6	0	0	100	100	90-100	45-80	30-40	11-20
	33-80	Fine sandy loam, sandy clay loam, clay loam	CL, SC	A-6	0	0	100	100	90-100	45-80	30-40	11-20
Craigen---------	0-3	Loamy fine sand	SM	A-2-4	0	0	100	95-100	50-75	15-30	16-20	NP-4
	3-27	Loamy fine sand	SM	A-2-4	0	0	100	95-100	50-75	15-30	16-20	NP-4
	27-40	Sandy clay loam, sandy clay	SC	A-6, A-7	0	0	100	95-100	80-95	35-50	32-48	13-25
	40-80	Sandy clay loam, fine sandy loam	SC	A-4, A-6, A-7-6	0	0	100	95-100	70-90	35-45	26-44	8-22

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
MrA:												
Morey-----------	0-5	Loam	CL, CL-ML	A-6	0	0	100	95-100	90-100	75-95	23-40	5-18
	5-9	Loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	90-100	75-95	23-40	5-18
	9-26	Silty clay loam, clay loam, silt loam	CL	A-6, A-7	0	0	100	95-100	90-100	85-95	34-50	14-30
	26-80	Silty clay loam, clay loam, silt loam	CL	A-6, A-7	0	0	100	95-100	90-100	85-95	34-50	14-30
Levac-----------	0-5	Silt loam	CL	A-4	0	0	100	100	90-100	70-90	28-35	9-15
	5-18	Silt loam, silty clay loam	CL	A-6, A-7-6	0	0	100	100	95-100	85-95	35-43	15-21
	18-34	Silty clay, clay	CH, CL	A-7	0	0	100	100	95-100	90-95	44-57	22-32
	34-52	Silty clay, clay	CH, CL	A-7	0	0	100	100	95-100	90-95	44-57	22-32
	52-80	Silty clay, clay	CH, CL	A-7	0	0	90-100	90-100	80-100	80-95	44-57	22-32
MsA:												
Morey-----------	0-5	Loam, silt loam	CL, CL-ML	A-6	0	0	100	95-100	90-100	75-95	23-40	5-18
	5-10	Silty clay loam, clay loam, silt loam	CL	A-6, A-7	0	0	100	95-100	90-100	85-95	34-50	14-30
	10-32	Silty clay loam, clay loam, silt loam	CL	A-6, A-7	0	0	100	95-100	90-100	85-95	34-50	14-30
	32-80	Clay loam, silty clay loam, silty clay	CH, CL	A-6, A-7	0	0	98-100	95-100	90-100	85-95	35-60	15-36

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	Percentage passing sieve number--: 10	Percentage passing sieve number--: 40	Percentage passing sieve number--: 200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Spindletop------	0-12	Silt loam	CL, CL-ML, ML	A-4	0	0	100	100	95-100	75-85	15-35	NP-12
	12-25	Silt loam, loam	CL, CL-ML, ML	A-4	0	0	100	100	95-100	75-85	15-35	NP-12
	25-29	Silty clay loam, silt loam, loam	CH, CL	A-7	0	0	100	100	95-100	85-95	46-56	25-33
	29-80	Silty clay loam, silty clay, clay	CH	A-7	0	0	100	100	95-100	90-95	52-60	28-35
NcC:												
Neches----------	0-5	Coarse sand	SM	A-2-4	0	0	90-100	85-100	60-80	9-30	10-18	1-5
	5-41	Stratified coarse sand to clay	SM	A-2-4	0	0	90-100	85-100	60-80	9-30	10-23	1-7
	41-45	Stratified clay to coarse sand	CH, CL	A-7	0	0	95-100	90-100	70-90	60-85	43-57	21-32
	45-54	Stratified clay to coarse sand	CL, CH	A-7	0	0	95-100	90-100	70-90	60-85	43-57	21-32
	54-80	Stratified clay to coarse sand	CH, CL	A-7	0	0	95-100	90-100	70-90	60-85	43-57	21-32
NeA:												
Neel------------	0-12	Clay	CH	A-7-6	0	0	95-100	90-100	90-95	80-95	60-80	36-50
	12-80	Clay	CH	A-7-6	0	0	95-100	90-100	90-100	80-95	60-80	36-50
NuC:												
Neel------------	0-12	Clay	CH	A-7-6	0	0	95-100	90-100	90-95	80-95	60-80	36-50
	12-80	Clay	CH	A-7	0	0	95-100	90-100	90-100	80-95	60-80	36-50
Urban Land------	0-40	Variable			---	---	---	---	---	---	---	---
OaB:												
Orcadia---------	0-5	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	34-44	15-23
	5-10	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	70-90	34-44	15-23
	10-15	Silty clay loam, silty clay, clay	CH, CL	A-7	0	0	100	100	95-100	85-95	46-56	25-33
	15-45	Silty clay, clay	CH	A-7	0	0	100	100	95-100	90-95	52-60	30-38
	45-59	Silty clay, clay	CH	A-7	0	0	100	100	95-100	90-95	52-65	30-40
	59-80	Silty clay, clay	CH	A-7	0	0	100	100	95-100	90-95	52-60	30-38

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
OcA:												
Orcadia---------	0-8	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	34-44	15-23
	8-15	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	34-44	15-23
	15-18	Silty clay loam, silty clay, clay, silt loam	CH, CL	A-7	0	0	100	100	95-100	85-95	46-56	25-33
	18-44	Silty clay, clay	CH	A-7	0	0	100	100	95-100	90-95	52-65	30-40
	44-80	Silty clay, clay	CH	A-7	0	0	100	100	95-100	90-95	52-60	30-38
Anahuac---------	0-9	Very fine sandy loam	CL-ML, ML	A-4	0	0	95-100	95-100	85-100	65-95	15-30	2-7
	9-18	Loam, very fine sandy loam	CL-ML, ML	A-4	0	0	95-100	95-100	85-100	65-95	15-30	2-7
	18-23	Silt loam, very fine sandy loam, loam	CL-ML, ML	A-4	0	0	95-100	95-100	85-100	65-95	15-30	2-7
	23-27	Silty clay, clay, silt loam	CH, CL	A-7	0	0	95-100	95-100	95-100	75-95	45-70	30-50
	27-80	Silty clay, clay	CH, CL	A-7	0	0	95-100	95-100	95-100	75-95	45-70	30-50
OsA:												
Orcadia---------	0-9	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	34-44	15-23
	9-18	Silt loam, very fine sandy loam	CL	A-6, A-7	0	0	100	100	90-100	70-90	34-44	15-23
	18-27	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	70-90	34-44	15-23
	27-80	Silty clay, clay	CH	A-7	0	0	100	100	95-100	90-95	52-60	30-38
Aris------------	0-4	Silt loam	CL, CL-ML	A-4, A-6	0	0	98-100	95-100	95-100	60-85	21-34	4-14
	4-10	Silt loam	CL, CL-ML	A-4, A-6	0	0	98-100	95-100	95-100	60-85	21-34	4-14
	10-48	Clay, clay loam, silty clay loam	CH, CL	A-7	0	0	100	95-100	95-100	60-80	42-62	21-36
	48-80	Clay, clay loam, silty clay loam	CH, CL	A-7	0	0	100	95-100	95-100	60-80	41-60	20-35

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
OuA:												
Orcadia---------	0-5	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	34-44	15-23
	5-10	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	34-44	15-23
	10-15	Silty clay loam, silty clay, clay, silt loam	CH, CL	A-7	0	0	100	100	95-100	85-95	46-56	25-33
	15-45	Silty clay, clay	CH	A-7	0	0	100	100	95-100	90-95	52-60	30-38
	45-59	Silty clay, clay	CH	A-7	0	0	100	100	95-100	90-95	52-65	30-40
	59-80	Silty clay, clay	CH	A-7	0	0	100	100	95-100	90-95	52-60	30-38
Urban Land------	0-40	Variable			---	---	---	---	---	---	---	---
Ow:												
Oil Wasteland---	0-80	Variable			---	---	---	---	---	---	---	---
Ps:												
Pits, Sand------	0-80	Variable			---	---	---	---	---	---	0-14	---
SbA:												
Sabine----------	0-12	Loamy fine sand	SM, SP, SP-SM	A-2-4, A-3	0	0	100	95-100	65-90	2-20	16-20	NP-3
	12-37	Fine sand, loamy fine sand	SM, SP, SP-SM	A-2-4, A-3	0	0	100	95-100	65-90	2-20	16-20	NP-3
	37-57	Fine sand, loamy fine sand	SM, SP, SP-SM	A-2-4, A-3	0	0	100	95-100	65-90	2-20	16-20	NP-3
	57-80	Fine sand, loamy fine sand	SM, SP, SP-SM	A-2-4, A-3	0	0	100	95-100	65-90	2-20	16-20	NP-3
Baines----------	0-12	Clay	CH	A-7	0	0	98-100	98-100	95-100	95-100	50-62	28-38
	12-33	Clay, clay loam	CH	A-7	0	0	98-100	98-100	95-100	90-100	50-62	28-38
	33-48	Fine sand, loamy fine sand	SM, SP, SP-SM	A-2-4, A-3	0	0	85-100	80-100	65-90	2-20	16-20	NP-3
	48-80	Fine sand, loamy fine sand	SM, SP, SP-SM	A-2-4, A-3	0	0	85-100	80-100	65-90	2-20	16-20	NP-3

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
ScA:												
Scatlake--------	0-8	Mucky clay	OH, MH	A-7	0	0	100	100	100	95-100	55-90	15-45
	8-80	Mucky clay, clay, mucky silty clay loam	MH, CH	A-7	0	0	100	100	100	95-100	55-90	15-55
SpA:												
Spurger---------	0-4	Loam	CL-ML, ML, SC-SM, SM	A-4	0	0	95-100	90-100	70-98	40-75	16-25	NP-7
	4-8	Loam	CL-ML, ML, SC-SM, SM	A-4	0	0	95-100	90-100	70-98	40-75	16-25	NP-7
	8-16	Clay, clay loam	CH, CL	A-7-6	0	0	95-100	95-100	90-100	59-85	41-70	20-40
	16-50	Clay, clay loam	CH, CL	A-7-6	0	0	95-100	95-100	90-100	59-85	41-70	20-40
	50-80	Sandy clay loam, stratified sandy clay loam to fine sandy loam to loamy fine sand, loam	CL, CL-ML, SC, SC-SM	A-2-4, A-2-6, A-4, A-6	0	0	95-100	90-100	80-100	25-55	20-40	4-20
StA:												
Spurger---------	0-8	Loam	CL-ML, ML, SC-SM, SM	A-4	0	0	95-100	90-100	70-98	40-75	16-25	NP-7
	8-12	Loam	CL-ML, ML, SC-SM, SM	A-4	0	0	95-100	90-100	70-98	40-75	16-25	NP-7
	12-34	Clay, clay loam	CH, CL	A-7-6	0	0	95-100	95-100	90-100	59-85	41-70	20-40
	34-43	Sandy clay loam, clay loam, loam	CL, CL-ML, SC, SC-SM	A-2-4, A-2-6, A-4, A-6	0	0	95-100	90-100	80-100	25-55	20-40	4-20
	43-80	Sandy clay loam, clay loam, loam	CL, CL-ML, SC, SC-SM	A-2-4, A-2-6, A-4, A-6	0	0	95-100	90-100	80-100	25-55	20-40	4-20
Camptown--------	0-7	Loam	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	90-100	75-98	16-32	3-12
	7-32	Silty clay loam, clay loam	CL	A-6	0	0	100	100	95-100	90-98	30-40	11-18
	32-80	Clay, silty clay, silty clay loam	CH, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-65	18-40

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
TaA:												
Texla-----------	0-3	Silt loam	CL	A-7, A-6	0	0	100	100	90-100	70-90	34-44	15-23
	3-8	Silt loam	CL	A-7, A-6	0	0	100	100	90-100	70-90	34-44	15-23
	8-13	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	70-90	34-44	15-23
	13-28	Silt loam, silty clay loam	CH, CL	A-7	0	0	100	100	95-100	85-95	46-56	25-33
	28-80	Silty clay, clay, silt loam	CH	A-7	0	0	100	100	95-100	90-95	52-60	30-38
TeB:												
Texla-----------	0-3	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	70-90	34-44	15-23
	3-6	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	70-90	34-44	15-23
	6-13	Silt loam, silty clay loam	CH, CL	A-7	0	0	100	100	95-100	85-95	46-56	25-33
	13-40	Silty clay, clay, silt loam	CH	A-7	0	0	100	100	95-100	90-95	52-60	30-38
	40-80	Silty clay, clay	CH	A-7	0	0	100	100	95-100	90-95	52-60	30-38
Evadale---------	0-9	Silt loam	CL, CL-ML, ML	A-4	0	0	100	95-100	90-100	75-100	16-31	NP-10
	9-30	Silty clay loam, clay loam, loam	CL	A-6	0	0	100	100	95-100	90-100	30-40	11-18
	30-80	Clay, silty clay, silty clay loam	CH, CL	A-6, A-7	0	0	100	100	95-100	90-100	35-65	18-40
TgA:												
Texla-----------	0-4	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	70-90	34-44	15-23
	4-9	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	70-90	34-44	15-23
	9-22	Silt loam, silty clay loam	CH, CL	A-7	0	0	100	100	95-100	85-95	46-56	25-33
	22-80	Silty clay, clay	CH	A-7	0	0	100	100	95-100	90-95	52-60	30-38

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
Gist------------	0-5	Very fine sandy loam	CL-ML, ML	A-4	0	0	98-100	98-100	95-100	60-90	16-25	NP-7
	5-20	Very fine sandy loam, loam, silt loam	CL-ML, ML	A-4	0	0	98-100	98-100	95-100	60-90	15-25	NP-7
	20-50	Loam, silt loam	CL, CL-ML, ML	A-4	0	0	98-100	98-100	95-100	70-95	15-30	2-10
	50-80	Clay loam, silty clay, clay, loam	CH, CL	A-7-6	0	0	98-100	98-100	98-100	75-98	41-60	19-35
VaA:												
Vamont----------	0-3	Clay	CH	A-7-6	0	0	100	85-100	75-100	75-96	50-62	28-41
	3-11	Clay	CH	A-7-6	0	0	100	85-100	75-100	75-96	50-62	28-41
	11-47	Clay, silty clay	CH	A-7-6	0	0	100	95-100	75-100	75-94	50-76	30-49
	47-80	Clay, silty clay	CH	A-7-6	0	0	100	95-100	75-100	75-94	50-76	30-49
VeA:												
Veston----------	0-3	Fine sandy loam	CL	A-4, A-6	0	0	98-100	98-100	80-100	51-85	26-35	8-15
	3-8	Fine sandy loam very fine sandy loam	CL	A-4, A-6	0	0	98-100	98-100	80-100	51-85	26-35	8-15
	8-16	Stratified loamy very fine sand to very fine sandy loam	CL, CL-ML	A-4, A-6	0	0	98-100	98-100	85-100	60-85	20-32	5-15
	16-26	Stratified silt loam to very fine sandy loam	CL, CL-ML	A-4, A-6	0	0	98-100	98-100	85-100	60-85	20-32	5-15
	26-38	Stratified fine sandy loam to silt loam to clay loam	CL, CL-ML	A-4, A-6	0	0	98-100	98-100	85-100	60-85	20-32	5-15
	38-60	Stratified fine sandy loam to loam to clay loam	CL, CL-ML	A-4, A-6	0	0	98-100	98-100	85-100	60-85	20-32	5-15
	60-80	Stratified fine sandy loam to loam to clay loam	CL, CL-ML	A-4, A-6	0	0	98-100	98-100	90-100	60-85	20-32	5-15

Table 16.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
VtA:												
Viterbo---------	0-7	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	80-95	35-48	15-25
	7-17	Silty clay loam, silty clay	CH, CL	A-7	0	0	100	100	95-100	85-95	44-57	22-32
	17-65	Silty clay, clay	CH, CL	A-7	0	0	100	100	95-100	90-95	48-66	25-39
	65-80	Silty clay, clay	CH, CL	A-7	0	0	100	100	95-100	90-95	48-66	25-39
ZuA:												
Zummo-----------	0-8	Muck	PT	A-8	0	0	---	---	---	---	0-14	---
	8-24	Clay, silty clay	CH	A-7	0	0	100	100	98-100	95-100	60-76	36-49
	24-46	Clay, silty clay	CH	A-7	0	0	100	100	98-100	95-100	60-76	36-49
	46-80	Clay, silty clay	CH	A-7	0	0	100	100	98-100	95-100	60-76	36-49

Table 17.--Physical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
AmA:														
Allemands	0-18	---	---	0-0	0.05-0.25	2-20	0.20-0.50	0.0-2.9	30-60	---	---	2	8	0
	18-28	2-8	3-20	60-95	0.50-1.00	0.0015-0.06	0.14-0.18	6.0-8.9	0.5-3.0	.32	.32			
	28-80	2-8	3-20	60-95	0.50-1.00	0.0015-0.06	0.12-0.18	6.0-8.9	0.5-1.0	.37	.37			
AnA:														
Anahuac	0-7	55-70	20-35	5-25	1.35-1.55	2-20	0.13-0.20	0.0-2.9	1.0-3.0	.55	.55	5	3	86
	7-18	40-55	30-45	5-25	1.35-1.60	0.6-6	0.13-0.20	0.0-2.9	0.5-1.5	.55	.55			
	18-22	40-55	30-45	10-25	1.35-1.55	0.6-6	0.13-0.20	0.0-2.9	0.5-1.0	.55	.55			
	22-41	15-28	20-45	40-60	1.45-1.60	0.0015-0.06	0.12-0.18	2.0-9.0	0.1-1.0	.17	.17			
	41-54	30-40	20-40	30-50	1.50-1.70	0.0015-0.06	0.15-0.18	1.0-6.0	0.1-0.5	.28	.28			
	54-80	30-60	20-40	18-35	1.50-1.70	0.2-2	0.14-0.18	3.0-7.0	0.1-0.3	.28	.28			
AsA:														
Anahuac	0-10	40-52	35-45	10-25	1.35-1.55	0.6-2	0.13-0.20	0.0-2.9	1.0-3.0	.43	.43	5	5	56
	10-19	35-60	30-60	10-25	1.35-1.55	0.6-2	0.13-0.20	0.0-2.9	0.5-1.0	.55	.55			
	19-24	40-60	20-60	10-25	1.35-1.55	0.6-2	0.13-0.20	0.0-2.9	0.5-1.0	.55	.55			
	24-45	10-30	20-50	40-60	1.45-1.60	0.0015-0.06	0.12-0.18	2.0-9.0	0.1-0.5	.17	.17			
	45-52	20-35	25-40	30-50	1.50-1.70	0.0015-0.06	0.15-0.18	1.0-6.0	0.1-0.5	.24	.24			
	52-80	30-60	12-40	18-35	1.50-1.70	0.2-2	0.14-0.18	3.0-7.0	0.1-0.3	.15	.15			
Aris	0-6	25-35	50-65	10-25	1.35-1.55	0.6-2	0.11-0.15	0.0-2.9	0.5-2.0	.43	.43	5	5	56
	6-14	15-35	35-60	25-35	1.30-1.50	0.2-0.6	0.12-0.17	3.0-5.9	0.5-1.0	.32	.32			
	14-23	5-25	40-60	35-50	1.40-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.0-0.5	.32	.32			
	23-72	15-30	25-60	35-45	1.40-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.0-0.5	.32	.32			
	72-80	15-35	25-60	30-45	1.40-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.0-0.5	.32	.32			
AuA:														
Anahuac	0-7	50-65	20-40	5-25	1.35-1.55	2-20	0.13-0.20	0.0-2.9	1.0-3.0	.55	.55	5	3	86
	7-18	45-60	30-50	5-25	1.35-1.60	0.6-6	0.13-0.20	0.0-2.9	0.5-1.5	.55	.55			
	18-22	30-60	30-55	10-25	1.35-1.55	0.6-6	0.13-0.20	0.0-2.9	0.5-1.0	.55	.55			
	22-41	10-30	20-50	40-60	1.45-1.60	0.0015-0.06	0.12-0.18	2.0-9.0	0.1-1.0	.17	.17			
	41-54	25-45	30-40	30-50	1.50-1.70	0.0015-0.06	0.15-0.18	1.0-6.0	0.1-0.5	.28	.28			
	54-80	30-60	25-40	18-35	1.50-1.70	0.2-2	0.14-0.18	3.0-7.0	0.1-0.3	.28	.28			
Urban Land	0-40	---	---	---	---	0.06-20	---	---	---	---	---	--	---	---
BaA:														
Bancker	0-8	---	---	0-0	0.10-0.40	2-20	0.20-0.50	0.0-2.9	30-70	---	---	5	8	0
	8-50	10-25	25-50	60-85	0.20-1.00	0.0015-0.06	0.14-0.18	0.0-2.9	2.0-8.0	.28	.28			
	50-80	10-25	25-50	60-85	0.20-1.00	0.0015-0.06	0.14-0.18	0.0-2.9	2.0-8.0	.28	.28			

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
BbA:														
Barbary-------------	0-5	0-25	5-30	60-95	0.25-1.00	0.0015-0.06	0.18-0.20	0.0-2.9	4.0-25	.32	.32	5	8	0
	5-48	0-10	10-25	60-95	0.25-1.00	0.0015-0.06	0.18-0.20	0.0-2.9	2.0-25	.32	.32			
	48-80	0-10	5-25	60-95	0.25-1.00	0.0015-0.06	0.18-0.20	0.0-2.9	2.0-25	.32	.32			
BcA:														
Barnett-------------	0-2	---	---	0-0	0.10-0.40	2-20	0.20-0.25	0.0-2.9	30-85	.37	.37	5	8	0
	2-6	20-30	20-40	35-60	1.10-1.40	0.0015-0.06	0.10-0.15	6.0-8.9	1.0-3.0	.32	.32			
	6-22	20-30	20-40	40-60	1.10-1.40	0.0015-0.06	0.10-0.15	6.0-8.9	1.0-3.0	.32	.32			
	22-80	20-30	20-40	40-60	1.00-1.50	0.0015-0.06	0.10-0.15	6.0-8.9	6.0-25	.32	.32			
BeA:														
Barnett-------------	0-4	10-20	45-60	25-35	1.30-1.50	0.2-0.6	0.12-0.17	3.0-5.9	0.5-1.0	.32	.32	5	8	0
	4-32	20-30	20-40	40-60	1.10-1.40	0.0015-0.06	0.10-0.15	6.0-8.9	1.0-3.0	.32	.32			
	32-80	20-30	20-40	40-60	1.00-1.50	0.0015-0.06	0.10-0.15	6.0-8.9	6.0-25	.32	.32			
Bh:														
Beaches-------------	0-80	---	---	0-3	1.35-1.50	>20	0.00-0.02	0.0-2.9	0.0-0.0	.15	.15	5	1	310
BmA:														
Beaumont------------	0-5	10-25	25-40	45-60	1.00-1.35	0.06-0.2	0.12-0.18	9.0-25.0	1.0-3.0	.32	.32	5	4	86
	5-9	5-25	25-45	45-60	1.25-1.45	0.06-0.2	0.12-0.18	9.0-25.0	1.0-2.0	.32	.32			
	9-19	5-25	25-45	45-60	1.25-1.45	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-2.0	.32	.32			
	19-80	5-25	25-45	45-60	1.30-1.50	0.0015-0.06	0.15-0.20	9.0-25.0	0.1-1.0	.32	.32			
BnA:														
Bevil---------------	0-9	15-25	25-50	45-60	1.15-1.35	0.06-0.2	0.12-0.18	9.0-25.0	1.0-3.0	.32	.32	5	4	86
	9-34	15-25	25-50	45-60	1.25-1.45	0.06-0.2	0.12-0.18	9.0-25.0	1.0-2.0	.32	.32			
	34-45	15-25	25-50	45-60	1.25-1.45	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-1.0	.32	.32			
	45-80	15-25	25-50	45-60	1.30-1.50	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-1.0	.32	.32			
BsB:														
Bienville-----------	0-14	80-95	2-8	4-15	1.35-1.65	6-20	0.07-0.11	0.0-2.9	0.5-2.0	.20	.20	5	2	134
	14-27	80-95	2-8	2-15	1.35-1.60	2-6	0.08-0.11	0.0-2.9	0.5-1.0	.20	.20			
	27-62	80-95	2-8	2-15	1.35-1.60	2-6	0.08-0.11	0.0-2.9	0.5-1.0	.20	.20			
	62-80	80-95	1-8	5-20	1.35-1.70	2-6	0.08-0.13	0.0-2.9	0.5-1.0	.20	.20			
BtA:														
Bienville-----------	0-8	80-90	2-8	4-15	1.35-1.65	6-20	0.07-0.11	0.0-2.9	0.5-2.0	.20	.20	5	2	134
	8-12	80-90	2-8	2-15	1.35-1.60	2-6	0.08-0.11	0.0-2.9	0.5-1.0	.20	.20			
	12-31	80-90	2-8	2-15	1.35-1.60	2-6	0.08-0.11	0.0-2.9	0.5-1.0	.20	.20			
	31-53	80-90	2-8	2-15	1.35-1.60	2-6	0.08-0.11	0.0-2.9	0.5-1.0	.20	.20			
	53-80	80-90	1-8	5-20	1.35-1.70	2-6	0.08-0.13	0.0-2.9	0.5-1.0	.20	.20			

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodibility group	Wind erodibility index
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
Camptown------------	0-5	---	40-70	5-18	1.30-1.50	0.2-0.6	0.12-0.18	0.0-2.9	1.0-2.0	.43	.43	5	5	56
	5-17	20-40	40-70	5-18	1.30-1.50	0.2-0.6	0.12-0.18	0.0-2.9	0.5-2.0	.43	.43			
	17-58	10-35	30-60	18-35	1.30-1.50	0.06-0.2	0.12-0.18	0.0-2.9	0.5-1.0	.37	.37			
	58-80	20-35	30-50	18-35	1.30-1.50	0.06-0.2	0.12-0.18	0.0-2.9	0.5-1.0	.37	.37			
BwA:														
Bleakwood-----------	0-6	35-50	30-50	5-12	1.20-1.40	0.6-2	0.10-0.15	0.0-2.9	1.0-2.0	.28	.28	5	5	56
	6-15	30-60	30-50	12-35	1.20-1.40	0.6-2	0.14-0.20	0.0-2.9	0.2-1.0	.28	.28			
	15-27	30-60	30-50	12-35	1.20-1.40	0.6-2	0.14-0.20	0.0-2.9	0.2-1.0	.28	.28			
	27-80	30-60	30-50	12-35	1.20-1.40	0.6-2	0.14-0.20	0.0-2.9	0.2-1.0	.28	.28			
CaA:														
Camptown------------	0-8	20-40	50-70	5-18	1.30-1.50	0.2-0.6	0.12-0.18	0.0-2.9	1.0-2.0	.43	.43	5	5	56
	8-14	20-40	40-70	5-18	1.30-1.50	0.2-0.6	0.12-0.18	0.0-2.9	0.5-2.0	.43	.43			
	14-40	5-25	30-70	18-35	1.30-1.50	0.06-0.2	0.12-0.18	0.0-2.9	0.5-1.0	.37	.37			
	40-80	5-25	30-60	35-45	1.30-1.60	0.0015-0.06	0.14-0.20	6.0-8.9	0.1-0.5	.32	.32			
CeA:														
Caplen--------------	0-12	---	---	---	0.80-1.00	0.06-0.2	0.12-0.25	0.0-2.9	20-60	.49	---	5	1	310
	12-37	5-30	15-40	60-95	0.25-1.00	0.0015-0.06	0.18-0.20	0.0-2.9	2.0-25	.32	.32			
	37-80	25-55	15-40	20-60	1.10-1.30	0.0015-0.06	0.05-0.12	0.0-2.9	0.5-1.0	.32	.32			
ChA:														
China---------------	0-4	5-25	20-40	45-60	1.15-1.35	0.0015-0.06	0.12-0.18	9.0-25.0	1.0-5.0	.32	.32	5	4	86
	4-28	5-25	20-40	45-60	1.25-1.40	0.0015-0.06	0.12-0.18	9.0-25.0	1.0-3.0	.32	.32			
	28-55	5-25	20-40	45-60	1.25-1.45	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-2.0	.32	.32			
	55-60	5-25	20-40	45-65	1.25-1.45	0.0015-0.06	0.12-0.18	9.0-25.0	0.1-1.0	.32	.32			
	60-80	5-25	20-40	45-65	1.25-1.45	0.0015-0.06	0.12-0.18	9.0-25.0	0.1-1.0	.32	.32			
CrA:														
Craigen-------------	0-7	70-90	4-20	2-10	1.35-1.50	6-20	0.07-0.11	0.0-2.9	1.0-3.0	.20	.20	5	2	134
	7-32	70-90	4-20	2-10	1.35-1.50	6-20	0.07-0.11	0.0-2.9	0.1-0.5	.20	.20			
	32-37	45-70	4-25	20-35	1.30-1.60	0.6-2	0.12-0.18	3.0-5.9	0.1-0.5	.28	.28			
	37-49	45-70	4-25	20-35	1.30-1.60	0.6-2	0.12-0.18	3.0-5.9	0.1-0.5	.28	.28			
	49-80	45-70	4-25	15-35	1.30-1.60	0.6-2	0.11-0.15	0.0-2.9	0.1-0.5	.28	.28			
CsA:														
Creole--------------	0-7	---	---	0-0	0.10-0.40	2-20	0.20-0.25	0.0-2.9	30-85	.37	.37	5	8	0
	7-13	10-30	25-55	35-74	1.00-1.50	0.0015-0.06	0.10-0.15	6.0-8.9	0.1-0.5	.32	.32			
	13-34	10-30	25-55	35-74	1.00-1.50	0.0015-0.06	0.10-0.15	6.0-8.9	0.1-0.5	.32	.32			
	34-58	10-30	25-55	35-74	1.00-1.50	0.0015-0.06	0.10-0.15	6.0-8.9	0.1-0.5	.32	.32			
	58-80	10-30	25-55	35-74	1.00-1.50	0.0015-0.06	0.10-0.15	6.0-8.9	0.1-0.5	.32	.32			

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
EsA:														
Estes	0-4	15-30	20-40	40-59	1.40-1.55	0.0015-0.06	0.12-0.18	6.0-8.9	0.5-5.0	.32	.32	5	4	86
	4-11	15-30	20-40	40-59	1.40-1.55	0.0015-0.06	0.12-0.18	6.0-8.9	0.5-5.0	.32	.32			
	11-23	15-30	20-40	40-59	1.40-1.55	0.0015-0.06	0.12-0.18	6.0-8.9	0.5-5.0	.32	.32			
	23-80	15-30	20-40	40-59	1.40-1.55	0.0015-0.06	0.12-0.18	6.0-8.9	0.5-5.0	.32	.32			
EvA:														
Evadale	0-5	20-40	50-65	5-18	1.20-1.50	0.2-0.6	0.16-0.22	0.0-2.9	0.5-2.0	.43	.43	5	5	56
	5-9	20-40	50-65	5-18	1.20-1.50	0.2-0.6	0.16-0.22	0.0-2.9	0.5-2.0	.43	.43			
	9-22	10-35	35-60	18-35	1.20-1.50	0.06-0.2	0.18-0.22	0.0-2.9	0.5-1.0	.32	.32			
	22-55	5-30	30-60	35-45	1.30-1.60	0.0015-0.06	0.14-0.20	6.0-8.9	0.1-0.5	.32	.32			
	55-80	5-30	30-60	35-45	1.30-1.60	0.0015-0.06	0.14-0.20	6.0-8.9	0.1-0.5	.32	.32			
FaA:														
Fausse	0-6	5-30	10-40	40-95	0.80-1.45	0.0015-0.06	0.18-0.20	9.0-25.0	2.0-15	.20	.20	5	8	0
	6-14	5-30	10-40	60-95	1.10-1.35	0.0015-0.06	0.18-0.20	9.0-25.0	0.5-1.0	.24	.24			
	14-68	5-30	10-35	60-95	1.10-1.35	0.0015-0.06	0.18-0.20	9.0-25.0	0.5-1.0	.24	.24			
	68-80	5-30	10-35	60-95	1.10-1.35	0.0015-0.06	0.18-0.20	9.0-25.0	0.5-1.0	.24	.24			
FrA:														
Franeau	0-16	10-30	15-40	45-60	1.15-1.15	0.0015-0.06	0.10-0.18	6.0-8.9	0.5-2.0	.32	.32	5	4	86
	16-21	10-30	15-40	45-60	1.25-1.40	0.0015-0.06	0.06-0.12	9.0-25.0	0.5-1.0	.32	.32			
	21-27	10-30	15-40	45-60	1.30-1.45	0.0015-0.06	0.06-0.12	9.0-25.0	0.0-0.5	.32	.32			
	27-61	10-30	15-40	45-60	1.30-1.45	0.0015-0.06	0.06-0.12	9.0-25.0	0.0-0.5	.32	.32			
	61-80	10-30	15-40	45-60	1.30-1.45	0.0015-0.06	0.06-0.12	9.0-25.0	0.0-0.5	.32	.32			
HaA:														
Harris	0-3	10-35	15-40	40-60	1.10-1.30	0.06-0.2	0.02-0.20	6.0-8.9	2.0-15	.20	.20	5	8	0
	3-22	10-35	15-40	40-60	1.10-1.30	0.06-0.2	0.02-0.20	6.0-8.9	2.0-15	.20	.20			
	22-80	5-35	15-50	40-60	1.10-1.30	0.0015-0.06	0.01-0.10	6.0-8.9	0.5-2.0	.32	.32			
ImA:														
Ijam	0-6	20-40	20-40	20-50	1.30-1.50	0.0015-0.06	0.10-0.12	6.0-8.9	0.5-1.0	.32	.32	5	4	86
	6-23	20-40	20-40	40-55	1.30-1.50	0.0015-0.06	0.10-0.12	6.0-8.9	0.0-0.5	.32	.32			
	23-65	20-40	20-40	40-55	1.30-1.50	0.0015-0.06	0.10-0.12	6.0-8.9	0.0-0.5	.32	.32			
	65-80	20-40	20-40	40-55	1.30-1.50	0.0015-0.06	0.10-0.12	6.0-8.9	0.0-0.5	.32	.32			
LaA:														
Labelle	0-6	10-35	50-65	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	6-12	10-35	40-60	30-40	1.30-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-3.0	.43	.43			
	12-30	5-30	35-55	35-50	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.5-2.0	.37	.37			
	30-80	5-30	35-55	35-50	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
LbA:														
Labelle-------------	0-11	15-35	50-65	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	11-18	5-20	40-60	30-40	1.30-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-3.0	.43	.43			
	18-23	5-35	25-60	30-40	1.30-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-3.0	.43	.43			
	23-80	5-35	25-50	35-50	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.5-2.0	.37	.37			
Anahuac-------------	0-10	45-65	15-60	10-25	1.35-1.55	0.6-2	0.13-0.20	0.0-2.9	1.0-3.0	.37	.37	5	5	56
	10-20	30-65	15-60	10-25	1.35-1.55	0.6-2	0.13-0.20	0.0-2.9	0.5-1.0	.37	.37			
	20-26	30-65	15-60	10-25	1.35-1.55	0.6-2	0.13-0.20	0.0-2.9	0.5-1.0	.37	.37			
	26-56	5-25	25-55	35-45	1.30-1.60	0.0015-0.06	0.14-0.20	6.0-8.9	0.1-0.5	.32	.32			
	56-80	5-25	25-55	35-45	1.30-1.60	0.0015-0.06	0.14-0.20	6.0-8.9	0.1-0.5	.32	.32			
LcA:														
Labelle-------------	0-12	15-40	50-70	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	12-18	10-20	40-65	30-40	1.30-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-3.0	.43	.43			
	18-24	10-35	20-50	35-50	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
	24-50	10-35	20-50	35-50	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
	50-80	10-35	20-50	35-50	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
Aris----------------	0-12	50-70	10-50	10-20	1.35-1.55	0.6-2	0.11-0.15	0.0-2.9	0.5-2.0	.37	.37	5	3	86
	12-22	10-60	10-60	25-35	1.30-1.50	0.2-0.6	0.12-0.17	3.0-5.9	0.5-1.0	.32	.32			
	22-34	5-35	20-65	35-50	1.40-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.0-0.5	.32	.32			
	34-80	5-35	20-65	35-45	1.40-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.0-0.5	.32	.32			
LdA:														
Labelle-------------	0-9	10-35	50-70	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	9-16	10-20	40-60	30-40	1.30-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-3.0	.43	.43			
	16-36	10-35	20-50	35-50	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.5-2.0	.37	.37			
	36-80	10-35	20-50	35-50	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.5-2.0	.37	.37			
Levac---------------	0-5	10-35	50-67	18-27	1.30-1.50	0.6-2	0.14-0.18	0.0-2.9	1.0-2.0	.43	.43	5	6	48
	5-18	10-35	40-60	20-35	1.30-1.55	0.2-0.6	0.14-0.18	3.0-5.9	1.0-2.0	.43	.43			
	18-34	10-35	20-60	35-50	1.35-1.60	0.06-0.2	0.12-0.18	6.0-8.9	0.5-2.0	.37	.37			
	34-52	5-30	20-55	35-50	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
	52-80	5-30	20-55	35-50	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
LeA:														
Labelle-------------	0-6	10-35	50-70	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	6-12	10-20	40-65	30-40	1.30-1.60	0.6-2	0.16-0.20	3.0-5.9	1.0-3.0	.43	.43			
	12-30	5-30	30-60	35-50	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.5-2.0	.37	.37			
	30-80	5-30	30-60	35-50	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
Urban Land----------	0-40	---	---	---	---	0.06-20	---	---	---	---	---	--	---	---

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
LmA:														
Larose	0-5	---	---	0-0	0.10-0.40	2-20	0.20-0.25	0.0-2.9	30-85	.37	.37	5	8	0
	5-9	5-30	20-50	50-80	0.50-1.00	0.0015-0.06	0.14-0.18	0.0-2.9	5.0-25	.28	.28			
	9-80	5-30	20-50	50-80	0.50-1.00	0.0015-0.06	0.14-0.18	0.0-2.9	5.0-25	.28	.28			
LtA:														
League	0-11	10-35	20-40	45-60	1.25-1.55	0.0015-0.06	0.12-0.18	9.0-25.0	1.0-5.0	.32	.32	5	4	86
	11-30	10-35	20-40	45-60	1.25-1.45	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-2.0	.32	.32			
	30-36	10-35	20-40	45-60	1.25-1.45	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-2.0	.32	.32			
	36-59	10-35	20-40	45-60	1.30-1.45	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-1.0	.32	.32			
	59-80	10-35	20-40	45-60	1.30-1.45	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-1.0	.32	.32			
LuA:														
League	0-11	10-30	20-40	45-60	1.25-1.55	0.0015-0.06	0.12-0.18	9.0-25.0	1.0-5.0	.32	.32	5	4	86
	11-30	10-30	20-40	45-60	1.25-1.45	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-2.0	.32	.32			
	30-36	10-30	20-40	45-60	1.25-1.45	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-2.0	.32	.32			
	36-59	10-30	20-40	45-60	1.30-1.45	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-1.0	.32	.32			
	59-80	10-30	20-40	45-60	1.30-1.45	0.0015-0.06	0.12-0.18	9.0-25.0	0.5-1.0	.32	.32			
Urban Land	0-40	---	---	---	---	0.06-20	---	---	---	---	---	--	---	---
LvA:														
Leerco	0-5	---	---	0-0	0.05-0.25	2-6	0.20-0.50	0.0-2.9	20-60	.49	.49	5	8	0
	5-14	10-35	10-50	40-60	0.20-1.00	0.0015-0.06	0.14-0.18	0.0-2.9	10-25	.28	.28			
	14-26	10-35	10-50	40-60	0.50-1.00	0.0015-0.06	0.14-0.18	6.0-8.9	2.0-10	.32	.32			
	26-80	10-35	10-50	40-60	0.50-1.00	0.0015-0.06	0.14-0.18	6.0-8.9	2.0-10	.32	.32			
LwA:														
Leton	0-4	30-52	30-50	10-25	1.20-1.50	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.43	.43	5	5	56
	4-8	30-52	30-50	10-25	1.20-1.50	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.43	.43			
	8-20	30-52	30-50	10-25	1.20-1.50	0.6-2	0.15-0.20	0.0-2.9	1.0-3.0	.43	.43			
	20-80	5-60	10-70	20-35	1.30-1.60	0.06-0.2	0.15-0.20	3.0-5.9	0.2-0.5	.37	.37			
McA:														
Meaton	0-14	5-40	30-70	18-27	1.30-1.55	0.6-2	0.12-0.18	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	14-32	5-40	30-70	18-35	1.30-1.55	0.6-2	0.12-0.18	3.0-5.9	1.0-3.0	.37	.37			
	32-76	5-40	30-70	27-40	1.30-1.60	0.06-0.2	0.12-0.18	3.0-5.9	0.5-2.0	.37	.37			
	76-80	5-40	30-60	40-55	1.30-1.60	0.0015-0.06	0.11-0.16	6.0-8.9	0.1-0.5	.32	.32			
Levac	0-7	10-40	50-70	18-27	1.30-1.50	0.6-2	0.14-0.18	0.0-2.9	1.0-2.0	.43	.43	5	6	48
	7-11	10-40	40-70	22-35	1.30-1.55	0.2-0.6	0.14-0.18	3.0-5.9	1.0-2.0	.43	.43			
	11-15	10-40	40-60	20-35	1.30-1.55	0.2-0.6	0.14-0.18	3.0-5.9	1.0-2.0	.43	.43			
	15-26	5-35	20-60	35-50	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
	26-80	5-35	20-60	35-50	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
MeA:														
Meaton	0-12	5-35	50-70	18-27	1.30-1.55	0.6-2	0.12-0.18	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	12-22	5-35	40-70	18-35	1.30-1.55	0.6-2	0.12-0.18	3.0-5.9	1.0-3.0	.37	.37			
	22-37	5-35	35-70	18-35	1.30-1.55	0.6-2	0.12-0.18	3.0-5.9	1.0-3.0	.37	.37			
	37-80	5-35	30-70	35-45	1.30-1.60	0.0015-0.06	0.14-0.20	6.0-8.9	0.1-0.5	.32	.32			
Spindletop	0-12	15-45	50-70	5-20	1.30-1.60	0.6-2	0.16-0.20	0.0-2.9	2.0-3.0	.43	.43	5	5	56
	12-28	15-45	40-70	5-20	1.30-1.60	0.6-2	0.16-0.20	0.0-2.9	1.0-2.0	.43	.43			
	28-35	10-40	40-70	18-35	1.35-1.60	0.2-0.6	0.14-0.18	3.0-5.9	0.5-1.0	.37	.37			
	35-40	5-40	40-70	18-35	1.35-1.60	0.2-0.6	0.14-0.18	3.0-5.9	0.5-1.0	.37	.37			
	40-80	5-35	20-65	35-50	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
MmA:														
Mollco	0-3	50-70	10-40	5-15	1.50-1.65	0.6-2	0.11-0.15	0.0-2.9	2.0-5.0	.28	.28	5	8	0
	3-16	50-70	10-40	5-15	1.50-1.65	0.6-2	0.11-0.15	0.0-2.9	1.0-2.0	.28	.28			
	16-38	40-70	5-40	18-30	1.40-1.60	0.2-0.6	0.12-0.17	3.0-5.9	0.1-0.5	.32	.32			
	38-80	35-70	5-40	15-35	1.40-1.60	0.2-0.6	0.12-0.17	3.0-5.9	0.1-0.5	.32	.32			
MoA:														
Mollco	0-5	50-70	10-50	5-15	1.50-1.65	0.6-2	0.11-0.15	0.0-2.9	2.0-5.0	.28	.28	5	8	0
	5-14	50-70	10-50	5-15	1.50-1.65	0.6-2	0.11-0.15	0.0-2.9	1.0-2.0	.28	.28			
	14-20	50-70	10-50	15-35	1.30-1.60	0.6-2	0.11-0.15	0.0-2.9	0.1-0.5	.28	.28			
	20-33	30-70	10-50	15-35	1.40-1.60	0.2-0.6	0.12-0.17	3.0-5.9	0.1-0.5	.32	.32			
	33-80	30-70	10-50	15-35	1.40-1.60	0.2-0.6	0.12-0.17	3.0-5.9	0.1-0.5	.32	.32			
Craigen	0-4	70-90	2-30	2-10	1.35-1.50	6-20	0.07-0.11	0.0-2.9	1.0-3.0	.20	.20	5	2	134
	4-27	70-90	2-30	2-10	1.35-1.50	6-20	0.07-0.11	0.0-2.9	0.1-0.5	.20	.20			
	27-40	45-70	2-25	20-35	1.30-1.60	0.6-2	0.12-0.18	3.0-5.9	0.1-0.5	.28	.28			
	40-80	45-70	2-25	15-35	1.30-1.60	0.6-2	0.11-0.15	0.0-2.9	0.1-0.5	.28	.28			
MrA:														
Morey	0-5	30-50	30-50	10-30	1.25-1.50	0.6-2	0.14-0.18	0.0-2.9	1.0-4.0	.37	.37	5	6	48
	5-9	30-50	30-50	10-30	1.25-1.50	0.6-2	0.14-0.18	0.0-2.9	1.0-4.0	.37	.37			
	9-26	10-35	30-70	20-35	1.25-1.50	0.06-0.2	0.14-0.18	3.0-5.9	0.5-2.0	.37	.37			
	26-80	10-35	30-70	20-35	1.25-1.50	0.06-0.2	0.14-0.18	3.0-5.9	0.5-2.0	.37	.37			
Levac	0-5	15-35	50-70	18-27	1.30-1.50	0.6-2	0.14-0.18	0.0-2.9	1.0-2.0	.43	.43	5	6	48
	5-18	10-35	40-70	20-35	1.30-1.55	0.2-0.6	0.14-0.18	3.0-5.9	1.0-2.0	.43	.43			
	18-34	15-30	20-60	35-50	1.35-1.60	0.06-0.2	0.12-0.18	6.0-8.9	0.5-2.0	.37	.37			
	34-52	15-30	20-60	35-50	1.35-1.60	0.06-0.2	0.12-0.18	6.0-8.9	0.5-2.0	.37	.37			
	52-80	5-30	20-60	35-50	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
MsA:														
Morey---------------	0-5	30-45	30-50	10-30	1.25-1.50	0.6-2	0.14-0.18	0.0-2.9	1.0-4.0	.37	.37	5	6	48
	5-10	5-40	30-70	20-35	1.25-1.50	0.06-0.2	0.14-0.18	3.0-5.9	0.5-2.0	.37	.37			
	10-32	5-40	30-70	20-35	1.25-1.50	0.06-0.2	0.14-0.18	3.0-5.9	0.5-2.0	.37	.37			
	32-80	5-40	30-70	30-45	1.40-1.65	0.06-0.2	0.14-0.18	6.0-8.9	0.1-0.5	.37	.37			
Spindletop----------	0-12	20-40	50-70	5-20	1.30-1.60	0.6-2	0.16-0.20	0.0-2.9	2.0-3.0	.43	.43	5	5	56
	12-25	20-45	40-70	5-20	1.30-1.60	0.6-2	0.16-0.20	0.0-2.9	1.0-2.0	.43	.43			
	25-29	10-40	40-70	18-35	1.35-1.60	0.2-0.6	0.14-0.18	3.0-5.9	0.5-1.0	.37	.37			
	29-80	10-40	20-70	35-50	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
NcC:														
Neches--------------	0-5	85-95	1-25	2-10	1.50-1.70	6-20	0.04-0.07	0.0-2.9	0.1-1.0	.17	.17	5	1	160
	5-41	40-95	1-25	3-45	1.40-1.65	0.6-2	0.05-0.11	0.0-2.9	0.1-0.5	.24	.24			
	41-45	30-95	1-25	3-50	1.35-1.50	0.06-0.2	0.12-0.18	3.0-5.9	0.1-0.5	.32	.32			
	45-54	30-95	1-25	3-50	1.35-1.50	0.06-0.2	0.12-0.18	3.0-5.9	0.1-0.5	.32	.32			
	54-80	30-95	1-25	3-50	1.35-1.50	0.06-0.2	0.12-0.18	3.0-5.9	0.1-0.5	.32	.32			
NeA:														
Neel----------------	0-12	15-40	20-40	40-50	1.30-1.50	0.0015-0.06	0.10-0.12	6.0-8.9	0.5-1.0	.32	.32	5	4	86
	12-80	15-40	20-40	40-55	1.30-1.50	0.0015-0.06	0.10-0.12	6.0-8.9	0.1-0.5	.32	.32			
NuC:														
Neel----------------	0-12	20-40	20-40	40-50	1.30-1.50	0.0015-0.06	0.10-0.12	6.0-8.9	0.5-1.0	.32	.32	5	4	86
	12-80	20-40	20-40	40-55	1.30-1.50	0.0015-0.06	0.10-0.12	6.0-8.9	0.1-0.5	.32	.32			
Urban Land----------	0-40	---	---	---	---	0.06-20	---	---	---	---	---	--	---	---
OaB:														
Orcadia-------------	0-5	20-40	50-70	18-25	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	5-10	20-40	50-70	18-25	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	0.5-2.0	.43	.43			
	10-15	5-30	25-70	35-45	1.30-1.50	0.2-0.6	0.15-0.18	3.0-5.9	0.5-2.0	.37	.37			
	15-45	20-40	20-50	35-45	1.35-1.60	0.06-0.2	0.12-0.18	6.0-8.9	0.5-2.0	.37	.37			
	45-59	20-40	20-50	35-50	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
	59-80	20-40	20-50	35-45	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
OcA:														
Orcadia-------------	0-8	20-40	50-70	18-25	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	8-15	20-40	50-70	18-25	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	0.5-2.0	.43	.43			
	15-18	10-30	4-70	35-45	1.30-1.50	0.2-0.6	0.15-0.18	3.0-5.9	0.5-2.0	.37	.37			
	18-44	5-30	20-55	35-50	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
	44-80	5-30	20-55	35-45	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
Anahuac-------------	0-9	50-70	15-50	10-25	1.35-1.55	0.6-2	0.13-0.20	0.0-2.9	1.0-3.0	.37	.37	5	5	56
	9-18	50-70	15-50	10-25	1.35-1.55	0.6-2	0.13-0.20	0.0-2.9	1.0-3.0	.37	.37			
	18-23	20-60	30-70	10-25	1.35-1.55	0.6-2	0.13-0.20	0.0-2.9	0.5-1.0	.37	.37			
	23-27	4-30	20-65	40-60	1.45-1.60	0.0015-0.06	0.12-0.18	2.0-9.0	0.1-0.5	.32	.32			
	27-80	4-30	20-65	40-60	1.45-1.60	0.0015-0.06	0.12-0.18	2.0-9.0	0.1-0.5	.32	.32			
OsA:														
Orcadia-------------	0-9	20-40	50-70	18-25	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	9-18	20-40	50-70	18-25	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	0.5-2.0	.43	.43			
	18-27	20-40	50-70	18-25	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	0.5-2.0	.43	.43			
	27-80	10-40	15-50	35-45	1.35-1.60	0.06-0.2	0.12-0.18	6.0-8.9	0.5-2.0	.37	.37			
Aris----------------	0-4	20-40	50-70	10-25	1.35-1.55	0.6-2	0.11-0.15	0.0-2.9	0.5-2.0	.43	.43	5	5	56
	4-10	20-40	50-70	10-25	1.35-1.55	0.6-2	0.11-0.15	0.0-2.9	0.5-2.0	.43	.43			
	10-48	10-40	10-70	35-50	1.40-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.0-0.5	.32	.32			
	48-80	10-40	10-70	30-45	1.40-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.0-0.5	.32	.32			
OuA:														
Orcadia-------------	0-5	20-40	50-70	18-25	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	5-10	20-40	50-70	18-25	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	0.5-2.0	.43	.43			
	10-15	10-40	20-70	35-45	1.30-1.50	0.2-0.6	0.15-0.18	3.0-5.9	0.5-2.0	.37	.37			
	15-45	10-40	20-50	35-45	1.35-1.60	0.06-0.2	0.12-0.18	6.0-8.9	0.5-2.0	.37	.37			
	45-59	10-40	20-50	35-50	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
	59-80	10-40	20-50	35-45	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
Urban Land----------	0-40	---	---	---	---	0.06-20	---	---	---	---	---	--	---	---
Ow:														
Oil Wasteland-------	0-80	---	---	---	---	0.06-20	---	---	---	---	---	--	---	---
Ps:														
Pits, Sand----------	0-80	---	---	---	---	0.06-20	0.01-0.10	0.0-2.9	---	.10	---	1	1	180
SbA:														
Sabine--------------	0-12	70-90	1-20	2-10	1.30-1.50	6-20	0.07-0.12	0.0-2.9	1.0-2.0	.15	.15	5	2	134
	12-37	70-95	1-20	2-10	1.40-1.60	6-20	0.05-0.10	0.0-2.9	0.3-1.0	.15	.15			
	37-57	70-95	1-20	2-10	1.40-1.60	6-20	0.05-0.10	0.0-2.9	0.3-1.0	.15	.15			
	57-80	70-95	1-20	2-10	1.40-1.60	6-20	0.05-0.10	0.0-2.9	0.3-1.0	.15	.15			
Baines--------------	0-12	20-40	15-40	35-45	1.25-1.45	0.0015-0.06	0.10-0.15	6.0-8.9	2.0-8.0	.37	.37	4	8	0
	12-33	20-40	15-40	35-45	1.35-1.60	0.0015-0.06	0.10-0.15	6.0-8.9	1.0-3.0	.37	.37			
	33-48	70-95	2-20	2-10	1.45-1.65	6-20	0.04-0.07	0.0-2.9	0.1-0.5	.28	.28			
	48-80	70-95	2-20	2-10	1.45-1.65	6-20	0.04-0.07	0.0-2.9	0.1-0.5	.28	.28			

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
ScA:														
Scatlake------------	0-8	20-40	15-40	27-60	0.50-1.00	0.06-0.2	0.05-0.15	0.0-2.9	2.0-25	.24	.24	5	---	---
	8-80	20-40	10-65	27-60	0.50-1.00	0.06-0.2	0.05-0.15	0.0-2.9	0.5-1.0	.24	.24			
SpA:														
Spurger-------------	0-4	30-50	30-50	8-18	1.10-1.40	0.6-2	0.11-0.20	0.0-2.9	0.5-2.0	.37	.37	5	5	56
	4-8	30-50	30-50	8-18	1.10-1.40	0.6-2	0.11-0.20	0.0-2.9	0.5-2.0	.37	.37			
	8-16	20-45	10-40	35-60	1.20-1.50	0.06-0.2	0.12-0.18	3.0-5.9	0.2-0.5	.32	.32			
	16-50	20-45	10-40	35-60	1.20-1.50	0.06-0.2	0.12-0.18	3.0-5.9	0.2-0.5	.32	.32			
	50-80	20-70	10-40	2-35	1.20-1.50	0.2-0.6	0.12-0.17	0.0-2.9	0.1-0.5	.32	.32			
StA:														
Spurger-------------	0-8	30-50	30-50	8-18	1.10-1.40	0.6-2	0.11-0.20	0.0-2.9	0.5-2.0	.37	.37	5	5	56
	8-12	30-50	30-50	8-18	1.10-1.40	0.6-2	0.11-0.20	0.0-2.9	0.5-2.0	.37	.37			
	12-34	10-40	15-40	35-60	1.20-1.50	0.06-0.2	0.12-0.18	3.0-5.9	0.2-0.5	.32	.32			
	34-43	20-60	20-45	18-35	1.20-1.50	0.2-0.6	0.12-0.17	0.0-2.9	0.1-0.5	.32	.32			
	43-80	30-60	10-45	18-35	1.20-1.50	0.2-0.6	0.12-0.17	0.0-2.9	0.1-0.5	.32	.32			
Camptown------------	0-7	10-35	50-70	5-18	1.30-1.50	0.2-0.6	0.12-0.18	0.0-2.9	1.0-2.0	.43	.43	5	5	56
	7-40	10-35	30-70	18-35	1.30-1.50	0.06-0.2	0.12-0.18	0.0-2.9	0.5-1.0	.37	.37			
	40-80	10-35	20-60	35-45	1.30-1.60	0.0015-0.06	0.14-0.20	6.0-8.9	0.1-0.5	.32	.32			
TaA:														
Texla---------------	0-3	5-30	50-80	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	3-8	5-30	50-80	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.43	.43			
	8-13	5-30	50-80	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-2.0	.43	.43			
	13-28	5-30	50-70	25-34	1.35-1.60	0.6-2	0.12-0.18	3.0-5.9	0.5-2.0	.37	.37			
	28-80	5-30	30-55	35-50	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
TeB:														
Texla---------------	0-3	5-30	50-80	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	3-6	5-30	50-80	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-2.0	.43	.43			
	6-13	5-30	45-80	25-34	1.35-1.60	0.6-2	0.12-0.18	3.0-5.9	0.5-2.0	.37	.37			
	13-40	10-35	20-65	35-50	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
	40-80	10-35	20-55	35-50	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
Evadale-------------	0-9	15-40	50-70	5-18	1.20-1.50	0.2-0.6	0.16-0.22	0.0-2.9	0.5-2.0	.43	.43	5	5	56
	9-30	20-40	30-65	18-35	1.20-1.50	0.06-0.2	0.18-0.22	0.0-2.9	0.5-1.0	.32	.32			
	30-80	20-40	20-60	35-45	1.30-1.60	0.0015-0.06	0.14-0.20	6.0-8.9	0.1-0.5	.32	.32			
TgA:														
Texla---------------	0-4	5-35	50-75	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	4-9	5-35	50-75	18-27	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-2.0	.43	.43			
	9-22	5-30	40-70	25-34	1.35-1.60	0.6-2	0.12-0.18	3.0-5.9	0.5-2.0	.37	.37			
	22-80	15-35	20-50	35-50	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			

Table 17.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
Gist----------------	0-5	30-70	20-45	3-12	1.20-1.40	0.6-2	0.13-0.20	0.0-2.9	0.5-1.0	.37	.37	5	3	86
	5-20	30-70	20-60	3-12	1.20-1.40	0.6-2	0.13-0.20	0.0-2.9	0.1-0.5	.37	.37			
	20-50	25-50	30-50	8-18	1.20-1.40	0.6-2	0.13-0.20	0.0-2.9	0.1-0.5	.37	.37			
	50-80	10-40	20-40	35-60	1.30-1.50	0.0015-0.06	0.15-0.20	6.0-8.9	0.1-0.5	.32	.32			
VaA:														
Vamont--------------	0-3	10-40	15-50	40-60	1.15-1.40	0.06-0.2	0.12-0.17	6.0-8.9	0.5-2.0	.32	.32	5	4	86
	3-11	10-40	15-50	40-60	1.15-1.40	0.06-0.2	0.12-0.17	6.0-8.9	0.5-2.0	.32	.32			
	11-47	10-40	15-50	45-60	1.20-1.45	0.0015-0.06	0.12-0.17	6.0-8.9	0.5-1.0	.32	.32			
	47-80	10-40	15-50	45-60	1.20-1.45	0.0015-0.06	0.12-0.17	6.0-8.9	0.5-1.0	.32	.32			
VeA:														
Veston--------------	0-3	50-70	15-50	5-15	1.20-1.40	0.6-2	0.05-0.15	0.0-2.9	0.5-1.0	.49	.49	5	3	86
	3-8	50-70	15-50	5-15	1.20-1.40	0.6-2	0.05-0.15	0.0-2.9	0.5-1.0	.49	.49			
	8-16	50-70	2-50	12-27	1.20-1.50	0.6-2	0.02-0.10	0.0-2.9	0.1-0.5	.49	.49			
	16-26	20-70	5-60	12-27	1.20-1.50	0.6-2	0.02-0.10	0.0-2.9	0.1-0.5	.49	.49			
	26-38	20-70	10-60	12-27	1.20-1.50	0.6-2	0.02-0.10	0.0-2.9	0.1-0.5	.49	.49			
	38-60	20-70	10-60	12-27	1.20-1.50	0.6-2	0.02-0.10	0.0-2.9	0.1-0.5	.49	.49			
	60-80	10-70	10-60	15-35	1.20-1.50	0.0015-0.06	0.02-0.10	3.0-5.9	0.1-0.5	.32	.32			
VtA:														
Viterbo-------------	0-7	10-20	40-70	25-40	1.30-1.50	0.6-2	0.16-0.20	0.0-2.9	1.0-3.0	.43	.43	5	6	48
	7-17	10-20	40-65	35-50	1.30-1.50	0.6-2	0.14-0.18	3.0-5.9	1.0-2.0	.37	.43			
	17-65	4-30	25-60	40-60	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
	65-80	5-35	25-55	40-60	1.35-1.60	0.0015-0.06	0.12-0.18	6.0-8.9	0.1-0.5	.37	.37			
ZuA:														
Zummo---------------	0-8	---	---	0-0	0.05-0.25	0.2-0.6	0.20-0.50	0.0-2.9	20-40	.32	.32	5	8	0
	8-24	10-30	20-50	45-60	1.30-1.45	0.0015-0.06	0.14-0.18	6.0-8.9	2.0-5.0	.32	.32			
	24-46	10-30	20-50	45-60	1.30-1.45	0.0015-0.06	0.14-0.18	6.0-8.9	1.0-3.0	.32	.32			
	46-80	10-30	20-50	45-60	1.30-1.45	0.0015-0.06	0.14-0.18	6.0-8.9	0.3-1.0	.32	.32			

Table 18.--Chemical Properties of the Soils

(Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
AmA:								
Allemands------------	0-18	70-100	---	5.1-7.8	0	0	0.0-2.0	0-15
	18-28	50-100	---	6.1-8.4	0	0	0.0-4.0	5-15
	28-80	10-100	---	6.1-8.4	0	0	0.0-4.0	5-15
AnA:								
Anahuac--------------	0-7	5.0-10	5.0-10	4.5-6.5	0	0	0.0-2.0	0-1
	7-18	5.0-10	3.0-6.0	4.5-6.5	0	0	0.0-2.0	0-1
	18-22	5.0-10	3.0-6.0	4.5-6.5	0	0	0.0-2.0	0-1
	22-41	20-30	15-25	4.5-6.0	0	0	0.0-2.0	0-4
	41-54	15-25	5.0-15	4.5-6.0	0	0	0.0-2.0	0-4
	54-80	9.0-20	5.0-15	5.1-6.5	0	0	0.0-2.0	0-6
AsA:								
Anahuac--------------	0-10	5.0-10	5.0-10	4.5-6.5	0	0	0.0-2.0	0-4
	10-19	5.0-10	3.0-6.0	4.5-6.5	0	0	0.0-2.0	0-4
	19-24	5.0-10	3.0-6.0	4.5-6.5	0	0	0.0-2.0	0-4
	24-45	20-30	15-25	4.5-6.0	0	0	0.0-2.0	0-6
	45-52	15-25	5.0-15	4.5-6.0	0	0	0.0-2.0	0-6
	52-80	9.0-20	5.0-15	5.1-6.5	0	0	0.0-2.0	0-6
Aris-----------------	0-6	10-20	---	4.5-6.5	0	0	0.0-2.0	0-4
	6-14	15-25	---	4.5-6.5	0	0	0.0-2.0	0-4
	14-23	15-30	---	4.5-6.5	0	0	0.0-2.0	0-4
	23-72	15-30	---	5.1-6.5	0	0	0.0-2.0	0-6
	72-80	15-25	---	5.6-7.3	0-3	0-3	0.0-2.0	0-6
AuA:								
Anahuac--------------	0-7	5.0-10	5.0-10	4.5-6.5	0	0	0.0-2.0	0-1
	7-18	5.0-10	3.0-6.0	4.5-6.5	0	0	0.0-2.0	0-1
	18-22	5.0-10	3.0-6.0	4.5-6.5	0	0	0.0-2.0	0-1
	22-41	20-30	15-25	4.5-6.0	0	0	0.0-2.0	0-4
	41-54	15-25	5.0-15	4.5-6.0	0	0	0.0-2.0	0-4
	54-80	9.0-20	5.0-15	5.1-6.5	0	0	0.0-2.0	0-6
Urban Land-----------	0-40	---	---	---	---	---	---	---
BaA:								
Bancker--------------	0-8	100-270	---	4.5-7.8	0	0	4.0-8.0	16-36
	8-50	50-100	---	5.6-8.4	0	0	4.0-8.0	16-36
	50-80	50-100	---	5.6-8.4	0	0	4.0-8.0	16-36
BbA:								
Barbary--------------	0-5	50-100	---	5.1-7.8	0	0	0.0-2.0	0-4
	5-48	50-100	---	5.6-7.8	0	0	0.0-2.0	0-4
	48-80	50-100	---	6.6-8.4	0	0	0.0-2.0	0-4
BcA:								
Barnett--------------	0-2	70-100	---	4.5-6.5	0	0	2.0-8.0	5-10
	2-6	30-50	---	5.1-6.5	0	0	2.0-16.0	5-13
	6-22	30-50	---	5.6-6.5	0	0	4.0-16.0	5-13
	22-80	30-80	---	5.6-7.3	0	0	8.0-30.0	5-13
BeA:								
Barnett--------------	0-4	15-25	---	4.5-6.5	0	0	2.0-8.0	5-10
	4-32	30-50	---	5.6-6.5	0	0	4.0-16.0	5-13
	32-80	30-80	---	5.6-7.3	0	0	8.0-30.0	5-13

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
Bh:								
Beaches	0-80	2.0-4.0	---	7.4-9.0	0	0	16.0-32.0	6-30
BmA:								
Beaumont	0-5	40-55	25-40	3.5-5.0	0	0	0.0-2.0	0-2
	5-9	35-45	25-40	3.5-6.0	0	0	0.0-2.0	0-6
	9-19	35-45	25-40	3.5-5.5	0	0	0.0-2.0	0-6
	19-80	35-45	25-40	4.5-7.3	0-5	0-5	0.0-2.0	0-6
BnA:								
Bevil	0-9	40-55	25-40	3.5-5.0	0	0	0.0-2.0	0-2
	9-34	35-45	25-40	3.5-5.0	0	0	0.0-2.0	0-2
	34-45	35-45	25-40	4.5-6.0	0	0	0.0-2.0	0-2
	45-80	25-40	25-40	4.5-7.3	0	0	0.0-2.0	0-2
BsB:								
Bienville	0-14	5.0-15	1.0-5.0	4.5-6.5	0	0	0.0-1.0	0-2
	14-27	2.0-15	0.5-5.0	4.5-6.5	0	0	0.0-1.0	0-2
	27-62	2.0-15	0.5-5.0	4.5-6.5	0	0	0.0-1.0	0-2
	62-80	2.0-20	2.0-15	4.5-6.0	0	0	0.0-1.0	0-2
BtA:								
Bienville	0-8	5.0-15	1.0-5.0	4.5-6.5	0	0	0.0-1.0	0-2
	8-12	2.0-15	0.5-5.0	4.5-6.5	0	0	0.0-1.0	0-2
	12-31	2.0-15	0.5-5.0	4.5-6.5	0	0	0.0-1.0	0-2
	31-53	2.0-15	0.5-5.0	4.5-6.5	0	0	0.0-1.0	0-2
	53-80	2.0-20	2.0-15	4.5-6.0	0	0	0.0-1.0	0-2
Camptown	0-5	4.0-10	2.0-8.0	3.5-5.5	0	0	0.0-2.0	2-6
	5-17	2.0-10	2.0-8.0	3.5-5.5	0	0	0.0-2.0	2-6
	17-58	10-25	8.0-20	3.5-5.5	0	0	0.0-4.0	2-8
	58-80	10-25	8.0-20	3.5-5.5	0	0	0.0-4.0	4-12
BwA:								
Bleakwood	0-6	4.0-15	2.0-10	4.5-6.5	0	0	0.0-0.5	0-2
	6-15	10-25	7.0-20	4.5-5.5	0	0	0.0-0.5	0-2
	15-27	10-25	7.0-20	4.5-5.5	0	0	0.0-0.5	0-2
	27-80	10-25	7.0-20	4.5-5.5	0	0	0.0-1.0	0-2
CaA:								
Camptown	0-8	4.0-10	2.0-8.0	3.5-5.5	0	0	0.0-2.0	2-6
	8-14	2.0-10	2.0-8.0	3.5-5.5	0	0	0.0-2.0	2-6
	14-40	10-25	8.0-20	3.5-5.5	0	0	0.0-4.0	2-8
	40-80	28-35	25-30	4.5-6.0	0	0	2.0-8.0	4-8
CeA:								
Caplen	0-12	50-150	---	6.1-7.8	0	0	2.0-4.0	8-60
	12-37	50-100	---	6.1-7.8	0	0	4.0-8.0	8-60
	37-80	20-60	---	6.1-7.8	0	0	4.0-8.0	8-60
ChA:								
China	0-4	35-50	30-40	3.5-5.0	0	0-2	0.0-2.0	0-4
	4-28	35-45	25-40	3.5-6.0	0	0-2	0.0-2.0	0-4
	28-55	30-45	30-45	4.5-6.5	0	0-5	0.0-4.0	0-4
	55-60	30-45	30-45	5.1-7.8	0-10	5-25	2.0-4.0	0-4
	60-80	30-45	30-45	5.6-7.8	0-10	0-20	2.0-4.0	0-4
CrA:								
Craigen	0-7	---	1.0-7.0	3.5-5.5	0	0	0.0-2.0	0
	7-32	---	1.0-7.0	3.5-5.5	0	0	0.0-2.0	0
	32-37	---	10-20	4.5-5.5	0	0	0.0-2.0	0
	37-49	---	10-20	4.5-5.5	0	0	0.0-2.0	0
	49-80	10-20	---	5.1-6.5	0	0	0.0-2.0	0

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
CsA:								
Creole---------------	0-7	70-100	---	5.6-7.3	0	0	2.0-8.0	5-10
	7-13	50-95	---	6.6-8.4	0	0-2	4.0-24.0	5-25
	13-34	50-95	---	6.6-8.4	0	0-2	4.0-24.0	5-25
	34-58	50-95	---	5.6-7.8	0	0-2	4.0-24.0	5-25
	58-80	50-95	---	6.6-8.4	0	0-2	4.0-24.0	5-25
EsA:								
Estes----------------	0-4	25-50	20-35	3.6-6.0	0	0	0.0-2.0	1-5
	4-11	25-50	20-35	3.6-6.0	0	0	0.0-2.0	1-5
	11-23	25-50	20-35	3.6-6.0	0	0	0.0-2.0	1-5
	23-80	25-50	20-35	3.6-6.0	0	0	0.0-2.0	1-5
EvA:								
Evadale--------------	0-5	7.0-15	4.0-10	4.5-6.0	0	0	0.0-2.0	0-4
	5-9	7.0-15	4.0-10	4.5-6.0	0	0	0.0-2.0	4-8
	9-22	8.0-20	5.0-15	4.5-6.0	0	0	0.5-4.0	4-8
	22-55	20-40	10-25	4.5-6.0	0	0-2	0.5-8.0	4-20
	55-80	20-40	10-25	4.5-6.0	0	0-2	0.5-8.0	6-20
FaA:								
Fausse---------------	0-6	50-100	---	5.1-6.0	0	0	0.0-2.0	0-8
	6-14	30-50	---	5.1-6.0	0	0	0.0-2.0	0-8
	14-68	30-50	20-35	3.5-6.0	0	0	0.0-2.0	0-8
	68-80	30-50	20-35	4.5-6.0	0	0	0.0-2.0	0-8
FrA:								
Franeau--------------	0-16	40-48	---	6.1-7.3	0-5	0	1.0-4.0	6-13
	16-21	40-50	---	6.1-7.3	2-15	0	2.0-8.0	13-20
	21-27	40-50	---	6.1-7.3	5-20	0	2.0-8.0	13-20
	27-61	40-50	---	6.6-8.4	5-20	0	2.0-8.0	13-20
	61-80	40-50	---	7.4-8.4	5-20	0	2.0-8.0	13-20
HaA:								
Harris---------------	0-3	25-40	---	6.6-9.0	0-5	0	16.0-32.0	10-30
	3-22	25-40	---	6.6-9.0	0-5	0	16.0-32.0	10-30
	22-80	25-40	---	6.6-9.0	5-10	0	16.0-32.0	10-30
ImA:								
Ijam-----------------	0-6	25-35	---	6.6-9.0	0-10	0	4.0-16.0	10-30
	6-23	25-35	---	6.6-9.0	0-10	0	4.0-16.0	10-30
	23-65	25-35	---	6.6-9.0	0-10	0	4.0-16.0	10-30
	65-80	25-35	---	6.6-9.0	0-10	0	4.0-16.0	10-30
LaA:								
Labelle--------------	0-6	18-25	---	5.1-6.5	0	0	0.0-2.0	0-2
	6-12	30-40	---	5.6-7.3	0	0	0.0-2.0	0-2
	12-30	35-50	---	5.6-7.3	0-1	0	0.0-2.0	0-2
	30-80	35-50	---	6.1-7.8	2-5	0	0.0-2.0	0-2
LbA:								
Labelle--------------	0-11	18-25	---	5.1-6.5	0	0	0.0-2.0	0-2
	11-18	30-40	---	5.6-7.3	0	0	0.0-2.0	0-2
	18-23	30-40	---	5.6-7.3	0	0	0.0-2.0	0-2
	23-80	35-50	---	5.6-7.8	0-1	0	0.0-2.0	0-2
Anahuac--------------	0-10	8.0-15	5.0-10	4.5-6.5	0	0	0.0-2.0	0-1
	10-20	8.0-15	3.0-6.0	4.5-6.5	0	0	0.0-2.0	0-1
	20-26	8.0-15	3.0-6.0	4.5-6.5	0	0	0.0-2.0	0-1
	26-56	15-35	10-25	4.5-6.0	0	0	2.0-8.0	4-16
	56-80	15-35	10-25	4.5-6.0	0	0	2.0-8.0	4-16

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
LcA:								
Labelle	0-12	18-25	---	5.1-6.5	0	0	0.0-2.0	0-2
	12-18	30-40	---	5.6-7.3	0	0	0.0-2.0	0-2
	18-24	35-50	---	6.1-7.8	2-5	0	0.0-2.0	0-2
	24-50	35-50	---	6.1-7.8	2-5	0	0.0-2.0	0-2
	50-80	35-50	---	6.1-7.8	2-5	0	0.0-2.0	0-2
Aris	0-12	10-20	---	4.5-6.5	0	0	0	0
	12-22	15-25	---	4.5-6.5	0	0	0	0-4
	22-34	15-30	---	4.5-6.5	0	0	0	0-4
	34-80	15-30	---	4.5-6.5	0	0	0	0-4
LdA:								
Labelle	0-9	18-25	---	5.1-6.5	0	0	0.0-2.0	0-2
	9-16	30-40	---	5.6-7.3	0	0	0.0-2.0	0-2
	16-36	35-50	---	5.6-7.8	0-1	0	0.0-2.0	0-2
	36-80	35-50	---	5.6-7.8	0-1	0	0.0-2.0	0-2
Levac	0-5	18-25	---	6.1-7.8	0	0	0.0-2.0	0-2
	5-18	25-35	---	6.6-8.4	0	0	0.0-2.0	0-2
	18-34	35-50	---	6.6-8.4	0-1	0	0.0-2.0	0-2
	34-52	35-50	---	6.6-8.4	1-5	0	0.0-2.0	0-2
	52-80	35-50	---	6.6-8.4	0-2	0	0.0-2.0	0-2
LeA:								
Labelle	0-6	18-25	---	5.1-6.5	0	0	0.0-2.0	0-2
	6-12	30-40	---	5.6-7.3	0	0	0.0-2.0	0-2
	12-30	35-50	---	5.6-7.3	0-1	0	0.0-2.0	0-2
	30-80	35-50	---	6.1-7.8	2-5	0	0.0-2.0	0-2
Urban Land	0-40	---	---	---	---	---	---	---
LmA:								
Larose	0-5	70-100	---	4.5-6.5	0	0	2.0-8.0	5-10
	5-9	50-100	---	4.5-7.8	0	0	0.0-4.0	0-15
	9-80	50-100	---	6.1-8.4	0	0	0.0-4.0	5-15
LtA:								
League	0-11	25-50	20-35	3.5-5.0	0	0	0.0-4.0	0-4
	11-30	25-40	25-40	4.5-5.5	0	0	0.0-4.0	0-4
	30-36	25-40	25-40	4.5-5.5	0	0	0.0-4.0	0-4
	36-59	30-45	30-45	5.1-7.8	0-1	0-4	0.0-4.0	0-4
	59-80	30-45	30-45	5.1-7.8	0-1	0-4	0.0-4.0	0-4
LuA:								
League	0-11	25-50	20-35	3.5-5.0	0	0	0.0-4.0	0-4
	11-30	25-40	25-40	4.5-5.5	0	0	0.0-4.0	0-4
	30-36	25-40	25-40	4.5-5.5	0	0	0.0-4.0	0-4
	36-59	30-45	30-45	5.1-7.8	0-1	0-4	0.0-4.0	0-4
	59-80	30-45	30-45	5.1-7.8	0-1	0-4	0.0-4.0	0-4
Urban Land	0-40	---	---	---	---	---	---	---
LvA:								
Leerco	0-5	70-100	---	5.6-7.3	0	0	2.0-4.0	4-8
	5-14	70-100	---	5.6-7.8	0	0	2.0-4.0	4-8
	14-26	50-70	---	5.6-7.8	0	0	4.0-16.0	4-8
	26-80	50-70	---	5.6-7.8	0	0	4.0-16.0	4-8

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
LwA:								
Leton----------------	0-4	5.0-15	---	5.1-7.3	0	0	0	0
	4-8	5.0-15	---	5.1-7.3	0	0	0	0
	8-20	5.0-15	---	5.1-7.3	0	0	0	0
	20-80	15-25	---	5.6-8.4	0	0	0	0
McA:								
Meaton---------------	0-14	18-25	---	5.6-7.3	0	0	0.0-2.0	0-4
	14-32	20-35	---	5.6-7.8	0	0	0.0-2.0	0-4
	32-76	25-40	---	6.6-8.4	0-1	0	0.0-2.0	0-4
	76-80	35-50	---	6.6-8.4	1-5	0	0.0-2.0	0-4
Levac----------------	0-7	18-25	---	6.1-7.8	0	0	0.0-2.0	0-2
	7-11	25-35	---	6.1-8.4	0	0	0.0-2.0	0-2
	11-15	25-35	---	6.6-8.4	0	0	0.0-2.0	0-2
	15-26	35-50	---	6.6-8.4	1-5	0	0.0-2.0	0-2
	26-80	35-50	---	6.6-8.4	0-2	0	0.0-2.0	0-2
MeA:								
Meaton---------------	0-12	18-25	---	5.6-7.3	0	0	0.0-2.0	0-4
	12-22	20-35	---	5.6-7.8	0	0	0.0-2.0	0-4
	22-37	20-35	---	6.1-7.8	0	0	0.0-2.0	0-4
	37-80	20-35	---	6.6-7.8	0	0	2.0-8.0	4-16
Spindletop-----------	0-12	5.0-15	---	5.1-7.3	0	0	0.0-2.0	0-2
	12-28	5.0-15	---	5.1-7.3	0	0	0.0-2.0	0-2
	28-35	20-30	---	5.1-7.8	0	0	0.0-2.0	0-2
	35-40	20-30	---	6.1-7.8	0	0	0.0-2.0	0-2
	40-80	35-50	---	6.1-8.4	0-5	0	0.0-2.0	0-2
MmA:								
Mollco---------------	0-3	---	4.0-10	3.5-5.5	0	0	0.0-2.0	0
	3-16	---	2.0-7.0	3.5-5.5	0	0	0.0-2.0	0
	16-38	10-20	8.0-15	3.5-6.5	0	0	0.0-2.0	0
	38-80	10-25	8.0-20	3.5-6.5	0	0	0.0-2.0	0
MoA:								
Mollco---------------	0-5	---	4.0-10	3.5-5.5	0	0	0.0-2.0	0
	5-14	---	2.0-7.0	3.5-5.5	0	0	0.0-2.0	0
	14-20	10-20	8.0-15	3.5-6.5	0	0	0.0-2.0	0
	20-33	10-25	8.0-20	3.5-6.5	0	0	0.0-2.0	0
	33-80	10-25	8.0-20	3.5-6.5	0	0	0.0-2.0	0
Craigen--------------	0-4	---	1.0-7.0	3.5-5.5	0	0	0.0-2.0	0
	4-27	---	1.0-7.0	3.5-5.5	0	0	0.0-2.0	0
	27-40	---	10-20	4.5-5.5	0	0	0.0-2.0	0
	40-80	10-20	---	5.1-6.5	0	0	0.0-2.0	0
MrA:								
Morey----------------	0-5	15-25	---	5.1-7.3	0	0	0.0-2.0	0-4
	5-9	15-25	---	5.1-7.3	0	0	0.0-2.0	0-4
	9-26	15-25	---	6.1-8.4	0-2	0	0.0-2.0	2-8
	26-80	15-25	---	6.1-8.4	0-2	0	0.0-2.0	2-8
Levac----------------	0-5	18-25	---	6.1-7.8	0	0	0.0-2.0	0-2
	5-18	25-35	---	6.6-8.4	0	0	0.0-2.0	0-2
	18-34	35-50	---	6.6-8.4	0-1	0	0.0-2.0	0-2
	34-52	35-50	---	6.6-8.4	0-1	0	0.0-2.0	0-2
	52-80	35-50	---	6.6-8.4	0-2	0	0.0-2.0	0-2

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
MsA:								
Morey	0-5	15-25	---	5.1-7.3	0	0	0.0-2.0	0-4
	5-10	15-25	---	6.1-8.4	0-2	0	0.0-2.0	2-8
	10-32	15-25	---	6.1-8.4	0-2	0	0.0-2.0	2-8
	32-80	20-35	---	7.4-8.4	0-5	0	0.0-2.0	2-8
Spindletop	0-12	5.0-15	---	5.1-7.3	0	0	0.0-2.0	0-2
	12-25	5.0-15	---	5.1-7.3	0	0	0.0-2.0	0-2
	25-29	20-30	---	6.1-7.8	0	0	0.0-2.0	0-2
	29-80	35-50	---	6.1-8.4	0-5	0	0.0-2.0	0-2
NcC:								
Neches	0-5	1.0-5.0	---	5.6-7.3	0-1	0	0.0-2.0	0-2
	5-41	1.0-9.0	---	5.6-7.3	0-1	0	0.0-2.0	0-2
	41-45	15-30	---	5.6-7.3	0-1	0	0.0-4.0	0-2
	45-54	15-30	---	5.6-7.3	0-1	0	2.0-4.0	2-6
	54-80	15-30	---	5.6-7.3	0-1	0	2.0-4.0	2-6
NeA:								
Neel	0-12	25-35	---	6.1-7.8	0-10	0	0.0-8.0	10-30
	12-80	25-35	---	6.1-7.8	0-10	0	2.0-16.0	10-30
NuC:								
Neel	0-12	25-35	---	6.1-7.8	0-10	0	0.0-8.0	10-30
	12-80	25-35	---	6.1-7.8	0-10	0	2.0-16.0	10-30
Urban Land	0-40	---	---	---	---	---	---	---
OaB:								
Orcadia	0-5	---	18-25	3.5-5.5	0	0	0.0-2.0	0
	5-10	---	15-20	3.5-5.5	0	0	0.0-2.0	0
	10-15	---	30-40	3.5-5.5	0	0	0.0-2.0	0
	15-45	---	35-50	3.5-5.5	0	0	0.0-2.0	0
	45-59	---	35-50	3.5-5.5	0	0	0.0-2.0	0
	59-80	---	35-50	3.5-5.5	0	0	0.0-2.0	0
OcA:								
Orcadia	0-8	---	18-25	3.5-5.5	0	0	0.0-2.0	0
	8-15	---	15-20	3.5-5.5	0	0	0.0-2.0	0
	15-18	---	30-40	3.5-5.5	0	0	0.0-2.0	0
	18-44	---	35-50	3.5-5.5	0	0	0.0-2.0	0
	44-80	---	35-50	3.5-5.5	0	0	0.0-2.0	0
Anahuac	0-9	5.0-10	5.0-10	4.5-6.5	0	0	0.0-2.0	0-1
	9-18	5.0-10	5.0-10	4.5-6.5	0	0	0.0-2.0	0-1
	18-23	5.0-10	3.0-6.0	4.5-6.5	0	0	0.0-2.0	0-1
	23-27	20-30	15-25	4.5-6.0	0	0	0.0-2.0	0-4
	27-80	20-30	15-25	4.5-6.0	0	0	0.0-2.0	0-4
OsA:								
Orcadia	0-9	---	18-25	3.5-5.5	0	0	0.0-2.0	0
	9-18	---	15-20	3.5-5.5	0	0	0.0-2.0	0
	18-27	---	15-20	3.5-5.5	0	0	0.0-2.0	0
	27-80	---	35-50	3.5-5.5	0	0	0.0-2.0	0
Aris	0-4	10-20	---	4.5-6.5	0	0	0	0
	4-10	10-20	---	4.5-6.5	0	0	0	0
	10-48	15-30	---	4.5-6.5	0	0	0	0-4
	48-80	15-25	---	5.1-7.3	0-3	0-3	0	0-6

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon-ate	Gypsum	Salinity	Sodium adsorp-tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
OuA:								
Orcadia	0-5	---	18-25	3.5-5.5	0	0	0.0-2.0	0
	5-10	---	15-20	3.5-5.5	0	0	0.0-2.0	0
	10-15	---	30-40	3.5-5.5	0	0	0.0-2.0	0
	15-45	---	35-50	3.5-5.5	0	0	0.0-2.0	0
	45-59	---	35-50	3.5-5.5	0	0	0.0-2.0	0
	59-80	---	35-50	3.5-5.5	0	0	0.0-2.0	0
Urban Land	0-40	---	---	---	---	---	---	---
Ow:								
Oil Wasteland	0-80	---	---	---	---	---	---	---
Ps:								
Pits, Sand	0-80	---	---	4.5-8.4	0	0	0.0-8.0	0
SbA:								
Sabine	0-12	1.0-5.0	---	5.6-8.4	0	0	0.0-2.0	0
	12-37	1.0-5.0	---	5.6-8.4	0	0	0.0-2.0	0-2
	37-57	1.0-5.0	---	5.6-8.4	0	0	0.0-2.0	0-2
	57-80	1.0-5.0	---	5.6-8.4	0	0	0.0-2.0	0-2
Baines	0-12	40-50	---	6.1-7.8	0	0	2.0-8.0	5-10
	12-33	35-50	---	6.6-8.4	0-3	0	2.0-8.0	5-10
	33-48	1.0-5.0	---	6.6-8.4	0-1	0	4.0-16.0	5-10
	48-80	1.0-5.0	---	6.6-8.4	0-1	0	4.0-16.0	5-10
ScA:								
Scatlake	0-8	60-100	---	5.6-8.4	0	0	8.0-16.0	9-18
	8-80	60-100	---	6.1-8.4	0	0	8.0-16.0	12-20
SpA:								
Spurger	0-4	4.0-10	2.0-8.0	4.5-6.5	0	0	0	0
	4-8	4.0-10	2.0-8.0	4.5-6.5	0	0	0	0
	8-16	25-35	15-25	4.5-6.0	0	0	0	0
	16-50	25-35	15-25	4.5-6.0	0	0	0	0
	50-80	5.0-20	4.0-15	4.5-6.0	0	0	0	0
StA:								
Spurger	0-8	4.0-10	2.0-8.0	4.5-6.5	0	0	0	0
	8-12	4.0-10	2.0-8.0	4.5-6.5	0	0	0	0
	12-34	25-35	15-25	4.5-6.0	0	0	0	0
	34-43	5.0-20	4.0-15	4.5-6.0	0	0	0	0
	43-80	5.0-20	4.0-15	4.5-6.0	0	0	0	0
Camptown	0-7	4.0-10	2.0-8.0	3.5-5.5	0	0	0.0-2.0	2-6
	7-40	10-25	8.0-20	3.5-5.5	0	0	0.0-4.0	2-8
	40-80	---	25-30	4.5-6.0	0	0	2.0-8.0	4-8
TaA:								
Texla	0-3	---	1.0-10	3.5-5.0	0	0	0.0-2.0	0-1
	3-8	---	1.0-10	3.5-5.0	0	0	0.0-2.0	0-1
	8-13	---	5.0-15	3.5-5.0	0	0	0.0-2.0	0-1
	13-28	---	5.0-20	3.5-5.5	0	0	0.0-2.0	0-4
	28-80	15-30	10-20	4.5-6.0	0	0-2	0.0-2.0	0-8
TeB:								
Texla	0-3	---	1.0-10	3.5-5.0	0	0	0.0-2.0	0-1
	3-6	---	5.0-15	3.5-5.0	0	0	0.0-2.0	0-1
	6-13	---	5.0-20	3.5-5.5	0	0	0.0-2.0	0-4
	13-40	15-30	10-20	4.5-6.0	0	0-2	0.0-2.0	0-8
	40-80	15-30	10-20	4.5-6.0	0	0-2	0.0-2.0	0-8

Table 18.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Effective cation exchange capacity	Soil reaction	Calcium carbon- ate	Gypsum	Salinity	Sodium adsorp- tion ratio
	In	meq/100 g	meq/100 g	pH	Pct	Pct	mmhos/cm	
Evadale	0-9	8.0-20	5.0-15	3.5-6.0	0	0	2.0-4.0	0-4
	9-30	12-25	10-20	3.5-6.0	0	0	2.0-4.0	2-6
	30-80	28-35	25-30	3.5-6.0	0	0	2.0-8.0	4-8
TgA:								
Texla	0-4	---	1.0-10	3.5-5.0	0	0	0.0-2.0	0-1
	4-9	---	5.0-15	3.5-5.0	0	0	0.0-2.0	0-1
	9-22	---	5.0-20	3.5-5.5	0	0	0.0-2.0	0-4
	22-80	15-30	10-20	4.5-6.0	0	0-2	0.0-2.0	0-8
Gist	0-5	4.0-10	2.0-6.0	3.5-6.0	0	0	0.0-2.0	0
	5-20	4.0-10	2.0-6.0	3.5-6.0	0	0	0.0-2.0	0
	20-50	6.0-15	5.0-10	3.5-5.5	0	0	0.0-2.0	0
	50-80	15-30	12-25	4.5-6.5	0	0	0.0-2.0	0
VaA:								
Vamont	0-3	20-45	15-35	4.5-6.5	0	0	0.0-2.0	0
	3-11	20-45	15-35	4.5-6.5	0	0	0.0-2.0	0
	11-47	25-40	15-35	4.5-6.5	0	0	0.0-2.0	0
	47-80	25-40	15-35	4.5-6.5	0	0	0.0-2.0	0
VeA:								
Veston	0-3	4.0-10	---	6.6-8.4	0-1	0	4.0-8.0	13-30
	3-8	4.0-10	---	6.6-8.4	0-1	0	4.0-8.0	13-30
	8-16	10-25	---	7.9-9.0	0-5	0-5	8.0-16.0	13-30
	16-26	10-25	---	7.9-9.0	0-5	0-5	8.0-16.0	13-30
	26-38	10-25	---	7.9-9.0	0-5	0-5	8.0-16.0	13-30
	38-60	10-25	---	7.9-9.0	0-5	0-5	8.0-16.0	13-30
	60-80	10-25	---	7.9-9.0	0-5	0-5	8.0-16.0	13-30
VtA:								
Viterbo	0-7	18-25	15-20	4.5-6.5	0	0	0.0-2.0	0-2
	7-17	20-30	18-25	4.5-6.5	0	0	0.0-2.0	0-2
	17-65	35-50	---	5.1-7.3	0-2	0	0.0-2.0	0-2
	65-80	35-50	---	5.1-7.3	0-2	0	0.0-2.0	0-2
ZuA:								
Zummo	0-8	---	70-100	4.5-6.0	0	0	0.0-2.0	0-2
	8-24	---	40-50	3.5-6.0	0	0	0.0-2.0	0-4
	24-46	40-50	---	4.5-6.5	0	0	0.0-2.0	0-4
	46-80	40-50	---	5.1-7.3	0	0	0.0-2.0	0-4

Table 19.--Water Features

(Depths of layers are in feet. See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
AmA:									
Allemands	D								
		January	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		February	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		March	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		April	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		May	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		June	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		July	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		August	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		September	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		October	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		November	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		December	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
AnA:									
Anahuac	C								
		January	1.5-1.8	1.7-1.8	---	---	None	---	None
			4.0-6.0	>6.0					
		February	1.5-1.8	1.7-1.8	---	---	None	---	None
			4.0-6.0	>6.0					
		March	1.5-1.8	1.7-1.8	---	---	None	---	None
			4.0-6.0	>6.0					
		April	4.0-6.0	>6.0	---	---	None	---	None
		November	1.5-1.8	1.7-1.8	---	---	None	---	None
			4.0-6.0	>6.0					
		December	1.5-1.8	1.7-1.8	---	---	None	---	None
			4.0-6.0	>6.0					
AsA:									
Anahuac	C								
		January	1.6-2.0	2.0-2.0	---	---	None	---	None
			4.0-6.0	>6.0					
		February	1.6-2.0	2.0-2.0	---	---	None	---	None
			4.0-6.0	>6.0					
		March	1.6-2.0	2.0-2.0	---	---	None	---	None
			4.0-6.0	>6.0					
		April	4.0-6.0	>6.0	---	---	None	---	None
		November	1.6-2.0	2.0-2.0	---	---	None	---	None
			4.0-6.0	>6.0					
		December	1.6-2.0	2.0-2.0	---	---	None	---	None
			4.0-6.0	>6.0					

Table 19.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
Aris	D								
		January	0.0-2.0	>6.0	0.0-0.3	Long	Frequent	---	None
		February	0.0-2.0	>6.0	0.0-0.3	Long	Frequent	---	None
		March	0.0-2.0	>6.0	0.0-0.3	Long	Frequent	---	None
		April	---	---	0.0-0.3	Long	Occasional	---	None
		May	---	---	0.0-0.3	Brief	Occasional	---	None
		June	---	---	0.0-0.3	Brief	Rare	---	None
		July	---	---	0.0-0.3	Brief	Rare	---	None
		August	---	---	0.0-0.3	Brief	Rare	---	None
		September	---	---	0.0-0.3	Brief	Rare	---	None
		October	---	---	0.0-0.3	Brief	Occasional	---	None
		November	0.0-2.0	>6.0	0.0-0.3	Long	Frequent	---	None
		December	0.0-2.0	>6.0	0.0-0.3	Long	Frequent	---	None
AuA:									
Anahuac	C								
		January	1.5-1.6	1.7-1.8	---	---	None	---	None
			4.0-6.0	>6.0					
		February	1.5-1.6	1.7-1.8	---	---	None	---	None
			4.0-6.0	>6.0					
		March	1.5-1.6	1.7-1.8	---	---	None	---	None
			4.0-6.0	>6.0					
		April	4.0-6.0	>6.0	---	---	None	---	None
		November	1.5-1.6	1.7-1.8	---	---	None	---	None
			4.0-6.0	>6.0					
		December	1.5-1.6	1.7-1.8	---	---	None	---	None
			4.0-6.0	>6.0					
Urban Land	D								
		Jan-Dec	---	---	---	---	None	---	None
BaA:									
Bancker	D								
		January	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		February	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		March	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		April	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		May	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		June	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		July	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		August	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		September	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		October	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		November	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		December	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent

Table 19.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
BbA:									
Barbary	D								
		January	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		February	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		March	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		April	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		May	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		June	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		July	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		August	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		September	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		October	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		November	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		December	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
BcA:									
Barnett	D								
		January	0.0-1.0	>6.0	---	---	None	Long	Frequent
		February	0.0-1.0	>6.0	---	---	None	Long	Frequent
		March	0.0-1.0	>6.0	---	---	None	Long	Frequent
		April	0.0-1.0	>6.0	---	---	None	Long	Frequent
		May	0.0-1.0	>6.0	---	---	None	Long	Frequent
		June	0.0-1.0	>6.0	---	---	None	Long	Frequent
		July	0.0-1.0	>6.0	---	---	None	Long	Frequent
		August	0.0-1.0	>6.0	---	---	None	Long	Frequent
		September	0.0-1.0	>6.0	---	---	None	Long	Frequent
		October	0.0-1.0	>6.0	---	---	None	Long	Frequent
		November	0.0-1.0	>6.0	---	---	None	Long	Frequent
		December	0.0-1.0	>6.0	---	---	None	Long	Frequent
BeA:									
Barnett	D								
		January	0.0-2.5	>6.0	---	---	None	Long	Frequent
		February	0.0-2.5	>6.0	---	---	None	Long	Frequent
		March	0.0-2.5	>6.0	---	---	None	Long	Frequent
		April	0.0-2.5	>6.0	---	---	None	Long	Frequent
		May	0.0-2.5	>6.0	---	---	None	Long	Frequent
		June	0.0-2.5	>6.0	---	---	None	Long	Frequent
		July	0.0-2.5	>6.0	---	---	None	Long	Frequent
		August	0.0-2.5	>6.0	---	---	None	Long	Frequent
		September	0.0-2.5	>6.0	---	---	None	Long	Frequent
		October	0.0-2.5	>6.0	---	---	None	Long	Frequent
		November	0.0-2.5	>6.0	---	---	None	Long	Frequent
		December	0.0-2.5	>6.0	---	---	None	Long	Frequent

Table 19.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
Bh:									
Beaches	A/D								
		January	0.0-0.5	>6.0	---	---	None	Brief	Very Frequent
		February	0.0-0.5	>6.0	---	---	None	Brief	Very Frequent
		March	0.0-0.5	>6.0	---	---	None	Brief	Very Frequent
		April	0.0-0.5	>6.0	---	---	None	Brief	Very Frequent
		May	0.0-0.5	>6.0	---	---	None	Brief	Very Frequent
		June	0.0-0.5	>6.0	---	---	None	Brief	Very Frequent
		July	0.0-0.5	>6.0	---	---	None	Brief	Very Frequent
		August	0.0-0.5	>6.0	---	---	None	Brief	Very Frequent
		September	0.0-0.5	>6.0	---	---	None	Brief	Very Frequent
		October	0.0-0.5	>6.0	---	---	None	Brief	Very Frequent
		November	0.0-0.5	>6.0	---	---	None	Brief	Very Frequent
		December	0.0-0.5	>6.0	---	---	None	Brief	Very Frequent
BmA:									
Beaumont	D								
		January	0.5-1.0	0.5-1.5	---	---	None	---	None
		February	0.5-1.0	0.5-1.5	---	---	None	---	None
		March	0.5-1.0	0.5-1.5	---	---	None	---	None
		November	0.5-1.0	0.5-1.5	---	---	None	---	None
		December	0.5-1.0	0.5-1.5	---	---	None	---	None
BnA:									
Bevil	D								
		January	0.0-1.0	1.0-2.0	---	---	None	---	None
		February	0.0-1.0	1.0-2.0	---	---	None	---	None
		March	0.0-1.0	1.0-2.0	---	---	None	---	None
		November	0.0-1.0	1.0-2.0	---	---	None	---	None
		December	0.0-1.0	1.0-2.0	---	---	None	---	None
BsB:									
Bienville	A								
		January	4.0-6.0	>6.0	---	---	None	---	None
		February	4.0-6.0	>6.0	---	---	None	---	None
		March	4.0-6.0	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		December	4.0-6.0	>6.0	---	---	None	---	None
BtA:									
Bienville	A								
		January	4.0-6.0	>6.0	---	---	None	---	None
		February	4.0-6.0	>6.0	---	---	None	---	None
		March	4.0-6.0	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		December	4.0-6.0	>6.0	---	---	None	---	None

Table 19.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
Camptown------------------	D								
		January	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		February	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		March	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		April	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		May	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		June	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		July	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		August	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		December	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
BwA:									
Bleakwood-----------------	C								
		January	0.0-1.5	>6.0	---	---	None	Long	Frequent
		February	0.0-1.5	>6.0	---	---	None	Long	Frequent
		March	0.0-1.5	>6.0	---	---	None	Long	Frequent
		April	0.0-1.5	>6.0	---	---	None	Long	Frequent
		May	0.0-1.5	>6.0	---	---	None	---	None
		November	0.0-1.5	>6.0	---	---	None	Long	Frequent
		December	0.0-1.5	>6.0	---	---	None	Long	Frequent
CaA:									
Camptown------------------	D								
		January	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		February	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		March	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		April	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		May	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		June	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		July	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		August	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
		December	0.0	>6.0	0.0-1.0	Long	Frequent	---	None
CeA:									
Caplen--------------------	D								
		January	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		February	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		March	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		April	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		May	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		June	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		July	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		August	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		September	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		October	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		November	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		December	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent

Table 19.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
ChA:									
China	D								
		Jan-Dec	---	---	---	---	None	---	None
CrA:									
Craigen	B								
		January	3.0-5.0	5.0-5.0	---	---	None	---	None
		February	3.0-5.0	5.0-5.0	---	---	None	---	None
		March	3.0-5.0	5.0-5.0	---	---	None	---	None
		April	3.0-5.0	5.0-5.0	---	---	None	---	None
CsA:									
Creole	D								
		January	0.0	>6.0	0.0-1.0	Long	Frequent	Long	Frequent
		February	0.0	>6.0	0.0-1.0	Long	Frequent	Long	Frequent
		March	0.0	>6.0	0.0-1.0	Long	Frequent	Long	Frequent
		April	0.0	>6.0	0.0-1.0	Long	Frequent	Long	Frequent
		May	0.0	>6.0	0.0-1.0	Long	Frequent	Long	Frequent
		June	0.0	>6.0	0.0-1.0	Long	Frequent	Long	Frequent
		July	0.0	>6.0	0.0-1.0	Long	Frequent	Long	Frequent
		August	0.0	>6.0	0.0-1.0	Long	Frequent	Long	Frequent
		September	0.0	>6.0	0.0-1.0	Long	Frequent	Long	Frequent
		October	0.0	>6.0	0.0-1.0	Long	Frequent	Long	Frequent
		November	0.0	>6.0	0.0-1.0	Long	Frequent	Long	Frequent
		December	0.0	>6.0	0.0-1.0	Long	Frequent	Long	Frequent
EsA:									
Estes	D								
		January	0.0-1.5	0.5-2.0	---	---	None	Long	Frequent
		February	0.0-1.5	0.5-2.0	---	---	None	Long	Frequent
		March	0.0-1.5	0.5-2.0	---	---	None	Long	Frequent
		April	0.0-1.5	0.5-2.0	---	---	None	Long	Frequent
		May	0.0-1.5	0.5-2.0	---	---	None	Long	Frequent
		November	0.0-1.5	0.5-2.0	---	---	None	Long	Frequent
		December	0.0-1.5	0.5-2.0	---	---	None	Long	Frequent
EvA:									
Evadale	D								
		January	0.0-1.5	0.5-2.5	---	---	None	---	None
		February	0.0-1.5	0.5-2.5	---	---	None	---	None
		March	0.0-1.5	0.5-2.5	---	---	None	---	None
		April	0.0-1.5	0.5-2.5	---	---	None	---	None
		December	0.0-1.5	0.5-2.5	---	---	None	---	None

Table 19.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
FaA:									
Fausse	D								
		January	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		February	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		March	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		April	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		May	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		June	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		July	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		August	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		September	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		October	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		November	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		December	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
FrA:									
Franeau	D								
		January	0.0-1.5	>6.0	---	---	None	Very brief	Occasional
		February	0.0-1.5	>6.0	---	---	None	Very brief	Occasional
		March	0.0-1.5	>6.0	---	---	None	Very brief	Occasional
		April	0.0-1.5	>6.0	---	---	None	Very brief	Occasional
		May	0.0-1.5	>6.0	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
		September	0.0-1.5	>6.0	---	---	None	Very brief	Occasional
		October	0.0-1.5	>6.0	---	---	None	Very brief	Occasional
		November	0.0-1.5	>6.0	---	---	None	Very brief	Occasional
		December	0.0-1.5	>6.0	---	---	None	Very brief	Occasional
HaA:									
Harris	D								
		January	0.0-2.5	>6.0	---	---	None	Long	Frequent
		February	0.0-2.5	>6.0	---	---	None	Long	Frequent
		March	0.0-2.5	>6.0	---	---	None	Long	Frequent
		April	0.0-2.5	>6.0	---	---	None	Long	Frequent
		May	0.0-2.5	>6.0	---	---	None	Long	Frequent
		June	0.0-2.5	>6.0	---	---	None	Long	Frequent
		September	0.0-2.5	>6.0	---	---	None	Long	Frequent
		October	0.0-2.5	>6.0	---	---	None	Long	Frequent
		November	0.0-2.5	>6.0	---	---	None	Long	Frequent
		December	0.0-2.5	>6.0	---	---	None	Long	Frequent

Table 19.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
ImA:									
Ijam	D								
		January	0.0-3.0	>6.0	---	---	None	Brief	Frequent
		February	0.0-3.0	>6.0	---	---	None	Brief	Frequent
		March	0.0-3.0	>6.0	---	---	None	Brief	Frequent
		April	0.0-3.0	>6.0	---	---	None	Brief	Frequent
		May	0.0-3.0	>6.0	---	---	None	Brief	Frequent
		June	---	---	---	---	None	Brief	Frequent
		September	0.0-3.0	>6.0	---	---	None	Brief	Frequent
		October	0.0-3.0	>6.0	---	---	None	Brief	Frequent
		November	0.0-3.0	>6.0	---	---	None	Brief	Frequent
		December	0.0-3.0	>6.0	---	---	None	Brief	Frequent
LaA:									
Labelle	D								
		January	0.5-1.5	1.0-2.0	---	---	None	---	None
		February	0.5-1.5	1.0-2.0	---	---	None	---	None
		March	0.5-1.5	1.0-2.0	---	---	None	---	None
LbA:									
Labelle	D								
		January	0.5-1.5	1.0-2.0	---	---	None	---	None
		February	0.5-1.5	1.0-2.0	---	---	None	---	None
		March	0.5-1.5	1.0-2.0	---	---	None	---	None
Anahuac	D								
		January	4.0-6.0	>6.0	---	---	None	---	None
		February	4.0-6.0	>6.0	---	---	None	---	None
		March	4.0-6.0	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		November	4.0-6.0	>6.0	---	---	None	---	None
		December	4.0-6.0	>6.0	---	---	None	---	None
LcA:									
Labelle	D								
		January	0.5-1.5	1.0-2.0	---	---	None	---	None
		February	0.5-1.5	1.0-2.0	---	---	None	---	None
		March	0.5-1.5	1.0-2.0	---	---	None	---	None
Aris	D								
		January	0.0-2.0	1.0-2.5	---	---	None	---	None
		February	0.0-2.0	1.0-2.5	---	---	None	---	None
		March	0.0-2.0	1.0-2.5	---	---	None	---	None
		November	0.0-2.0	1.0-2.5	---	---	None	---	None
		December	0.0-2.0	1.0-2.5	---	---	None	---	None

Table 19.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
LdA:									
Labelle	D								
		January	0.5-1.5	1.0-2.0	---	---	None	---	None
		February	0.5-1.5	1.0-2.0	---	---	None	---	None
		March	0.5-1.5	1.0-2.0	---	---	None	---	None
Levac	D								
		January	0.5-1.5	1.0-2.0	---	---	None	---	None
		February	0.5-1.5	1.0-2.0	---	---	None	---	None
		March	0.5-1.5	1.0-2.0	---	---	None	---	None
LeA:									
Labelle	D								
		January	0.5-1.5	1.0-2.0	---	---	None	---	None
		February	0.5-1.5	1.0-2.0	---	---	None	---	None
		March	0.5-1.5	1.0-2.0	---	---	None	---	None
Urban Land	D								
		Jan-Dec	---	---	---	---	None	---	None
LmA:									
Larose	D								
		January	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		February	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		March	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		April	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		May	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		June	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		July	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		August	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		September	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		October	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		November	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		December	0.0-0.5	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
LtA:									
League	D								
		January	0.5-1.0	1.0-1.5	---	---	None	---	None
		February	0.5-1.0	1.0-1.5	---	---	None	---	None
		March	0.5-1.0	1.0-1.5	---	---	None	---	None
LuA:									
League	D								
		January	0.5-1.0	1.0-1.5	---	---	None	---	None
		February	0.5-1.0	1.0-1.5	---	---	None	---	None
		March	0.5-1.0	1.0-1.5	---	---	None	---	None

Table 19.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
Urban Land	D								
		Jan-Dec	---	---	---	---	None	---	None
LvA:									
Leerco	D								
		January	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		February	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		March	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		April	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		May	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		June	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		July	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		August	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		September	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		October	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		November	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
		December	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Frequent
LwA:									
Leton	D								
		January	0.0-1.5	>6.0	---	---	None	Very long	Occasional
		February	0.0-1.5	>6.0	---	---	None	Very long	Occasional
		March	0.0-1.5	>6.0	---	---	None	Very long	Occasional
		April	0.0-1.5	>6.0	---	---	None	Very long	Occasional
		May	0.0-1.5	>6.0	---	---	None	Very long	Occasional
		October	0.0-1.5	>6.0	---	---	None	Very long	Occasional
		November	0.0-1.5	>6.0	---	---	None	Very long	Occasional
		December	0.0-1.5	>6.0	---	---	None	Very long	Occasional
McA:									
Meaton	C								
		January	0.0-1.5	0.5-1.5	---	---	None	---	None
		February	0.0-1.5	0.5-1.5	---	---	None	---	None
		March	0.0-1.5	0.5-1.5	---	---	None	---	None
		September	---	---	---	---	None	Very brief	Occasional
		October	---	---	---	---	None	Very brief	Occasional
Levac	D								
		January	0.5-1.5	1.0-2.0	---	---	None	---	None
		February	0.5-1.5	1.0-2.0	---	---	None	---	None
		March	0.5-1.5	1.0-2.0	---	---	None	---	None

Table 19.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
MeA:									
Meaton	C								
		January	0.0-1.5	0.5-1.5	---	---	None	---	None
		February	0.0-1.5	0.5-1.5	---	---	None	---	None
		March	0.0-1.5	0.5-1.5	---	---	None	---	None
		September	---	---	---	---	None	Very brief	Occasional
		October	---	---	---	---	None	Very brief	Occasional
Spindletop	D								
		January	1.5-3.0	2.0-3.5	---	---	None	---	None
		February	1.5-3.0	2.0-3.5	---	---	None	---	None
		March	1.5-3.0	2.0-3.5	---	---	None	---	None
MmA:									
Mollco	D								
		January	0.0	>6.0	0.0-0.5	Very long	Frequent	Brief	Frequent
		February	0.0	>6.0	0.0-0.5	Very long	Frequent	Brief	Frequent
		March	0.0	>6.0	0.0-0.5	Very long	Frequent	Brief	Frequent
		April	0.0	>6.0	0.0-0.5	Very long	Frequent	Brief	Frequent
		May	0.0	>6.0	0.0-0.5	Very long	Frequent	Brief	Frequent
		June	---	---	---	---	None	Brief	Frequent
		July	---	---	---	---	None	Brief	Frequent
		August	---	---	---	---	None	Brief	Frequent
		September	---	---	---	---	None	Brief	Frequent
		October	0.0	>6.0	0.0-0.5	Very long	Frequent	Brief	Frequent
		November	0.0	>6.0	0.0-0.5	Very long	Frequent	Brief	Frequent
		December	0.0	>6.0	0.0-0.5	Very long	Frequent	Brief	Frequent
MoA:									
Mollco	D								
		January	0.0	>6.0	0.0-0.5	Very long	Frequent	Brief	Frequent
		February	0.0	>6.0	0.0-0.5	Very long	Frequent	Brief	Frequent
		March	0.0	>6.0	0.0-0.5	Very long	Frequent	Brief	Frequent
		April	0.0	>6.0	0.0-0.5	Very long	Frequent	Brief	Frequent
		May	0.0	>6.0	0.0-0.5	Very long	Frequent	Brief	Frequent
		June	---	---	---	---	None	Brief	Frequent
		July	---	---	---	---	None	Brief	Frequent
		August	---	---	---	---	None	Brief	Frequent
		September	---	---	---	---	None	Brief	Frequent
		October	0.0	>6.0	0.0-0.5	Very long	Frequent	Brief	Frequent
		November	0.0	>6.0	0.0-0.5	Very long	Frequent	Brief	Frequent
		December	0.0	>6.0	0.0-0.5	Very long	Frequent	Brief	Frequent

Table 19.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
Craigen	B								
		January	3.5-5.0	>6.0	---	---	None	---	None
		February	3.5-5.0	>6.0	---	---	None	---	None
		March	3.5-5.0	>6.0	---	---	None	---	None
		April	3.5-5.0	>6.0	---	---	None	---	None
MrA:									
Morey	D								
		January	2.0-2.5	2.0-3.0	---	---	None	---	None
		February	2.0-2.5	2.0-3.0	---	---	None	---	None
		December	2.0-2.5	2.0-3.0	---	---	None	---	None
Levac	D								
		January	0.5-1.5	1.0-2.0	---	---	None	---	None
		February	0.5-1.5	1.0-2.0	---	---	None	---	None
		March	0.5-1.5	1.0-2.0	---	---	None	---	None
MsA:									
Morey	D								
		January	1.5-2.5	2.0-3.0	---	---	None	---	None
		February	1.5-2.5	2.0-3.0	---	---	None	---	None
		December	1.5-2.5	2.0-3.0	---	---	None	---	None
Spindletop	D								
		January	1.5-3.0	2.0-3.5	---	---	None	---	None
		February	1.5-3.0	2.0-3.5	---	---	None	---	None
		March	1.5-3.0	2.0-3.5	---	---	None	---	None
NcC:									
Neches	C								
		Jan-Dec	---	---	---	---	None	---	None
NeA:									
Neel	D								
		January	3.0-6.0	>6.0	---	---	None	Very brief	Occasional
		February	3.0-6.0	>6.0	---	---	None	Very brief	Occasional
		March	3.0-6.0	>6.0	---	---	None	Very brief	Occasional
		April	3.0-6.0	>6.0	---	---	None	Very brief	Occasional
		May	3.0-6.0	>6.0	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
		September	3.0-6.0	>6.0	---	---	None	Very brief	Occasional
		October	3.0-6.0	>6.0	---	---	None	Very brief	Occasional
		November	3.0-6.0	>6.0	---	---	None	Very brief	Occasional
		December	3.0-6.0	>6.0	---	---	None	Very brief	Occasional

Table 19.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
NuC:									
Neel	D								
		January	3.0-6.0	>6.0	---	---	None	Very brief	Rare
		February	3.0-6.0	>6.0	---	---	None	Very brief	Rare
		March	3.0-6.0	>6.0	---	---	None	Very brief	Rare
		April	3.0-6.0	>6.0	---	---	None	Very brief	Rare
		May	3.0-6.0	>6.0	---	---	None	Very brief	Rare
		June	---	---	---	---	None	Very brief	Rare
		July	---	---	---	---	None	Very brief	Rare
		August	---	---	---	---	None	Very brief	Rare
		September	3.0-6.0	>6.0	---	---	None	Very brief	Rare
		October	3.0-6.0	>6.0	---	---	None	Very brief	Rare
		November	3.0-6.0	>6.0	---	---	None	Very brief	Rare
		December	3.0-6.0	>6.0	---	---	None	Very brief	Rare
Urban Land	D								
		Jan-Dec	---	---	---	---	None	---	None
OaB:									
Orcadia	D								
		January	0.8-1.5	1.0-1.5	---	---	None	---	None
		February	0.8-1.5	1.0-1.5	---	---	None	---	None
		March	0.8-1.5	1.0-1.5	---	---	None	---	None
OcA:									
Orcadia	D								
		January	0.8-1.5	1.0-1.5	---	---	None	---	None
		February	0.8-1.5	1.0-1.5	---	---	None	---	None
		March	0.8-1.5	1.0-1.5	---	---	None	---	None
Anahuac	D								
		January	4.0-6.0	>6.0	---	---	None	---	None
		February	4.0-6.0	>6.0	---	---	None	---	None
		March	4.0-6.0	>6.0	---	---	None	---	None
		April	4.0-6.0	>6.0	---	---	None	---	None
		November	4.0-6.0	>6.0	---	---	None	---	None
		December	4.0-6.0	>6.0	---	---	None	---	None
OsA:									
Orcadia	D								
		January	0.8-1.5	1.0-1.5	---	---	None	---	None
		February	0.8-1.5	1.0-1.5	---	---	None	---	None
		March	0.8-1.5	1.0-1.5	---	---	None	---	None

Table 19.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
Aris	D								
		January	0.0-2.0	1.0-2.5	---	---	None	---	None
		February	0.0-2.0	1.0-2.5	---	---	None	---	None
		March	0.0-2.0	1.0-2.5	---	---	None	---	None
		November	0.0-2.0	1.0-2.5	---	---	None	---	None
		December	0.0-2.0	1.0-2.5	---	---	None	---	None
OuA:									
Orcadia	D								
		January	0.8-1.5	1.0-1.5	---	---	None	---	None
		February	0.8-1.5	1.0-1.5	---	---	None	---	None
		March	0.8-1.5	1.0-1.5	---	---	None	---	None
Urban Land	D								
		Jan-Dec	---	---	---	---	None	---	None
Ow:									
Oil Wasteland	D								
		Jan-Dec	---	---	---	---	None	---	None
Ps:									
Pits, Sand	D								
		Jan-Dec	---	---	---	---	None	---	None
SbA:									
Sabine	A								
		January	2.5-4.0	>6.0	---	---	None	---	None
		February	2.5-4.0	>6.0	---	---	None	---	None
		March	2.5-4.0	>6.0	---	---	None	---	None
		April	2.5-4.0	>6.0	---	---	None	---	None
		May	2.5-4.0	>6.0	---	---	None	---	None
		June	---	---	---	---	None	Brief	Occasional
		July	---	---	---	---	None	Brief	Occasional
		August	---	---	---	---	None	Brief	Occasional
		September	2.5-4.0	>6.0	---	---	None	Brief	Occasional
		October	2.5-4.0	>6.0	---	---	None	Brief	Occasional
		November	2.5-4.0	>6.0	---	---	None	---	None
		December	2.5-4.0	>6.0	---	---	None	---	None

Table 19.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
Baines	D								
		January	0.0	>6.0	0.5-1.0	Very long	Frequent	Long	Frequent
		February	0.0	>6.0	0.5-1.0	Very long	Frequent	Long	Frequent
		March	0.0	>6.0	0.5-1.0	Very long	Frequent	Long	Frequent
		April	0.0	>6.0	0.5-1.0	Very long	Frequent	Long	Frequent
		May	0.0	>6.0	0.5-1.0	Very long	Frequent	Long	Frequent
		June	0.0	>6.0	0.5-1.0	Very long	Frequent	Long	Frequent
		July	0.0	>6.0	0.5-1.0	Very long	Frequent	Long	Frequent
		August	0.0	>6.0	0.5-1.0	Very long	Frequent	Long	Frequent
		September	0.0	>6.0	0.5-1.0	Very long	Frequent	Long	Frequent
		October	0.0	>6.0	0.5-1.0	Very long	Frequent	Long	Frequent
		November	0.0	>6.0	0.5-1.0	Very long	Frequent	Long	Frequent
		December	0.0	>6.0	0.5-1.0	Very long	Frequent	Long	Frequent
ScA: Scatlake	D								
		January	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Very Frequent
		February	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Very Frequent
		March	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Very Frequent
		April	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Very Frequent
		May	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Very Frequent
		June	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Very Frequent
		July	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Very Frequent
		August	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Very Frequent
		September	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Very Frequent
		October	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Very Frequent
		November	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Very Frequent
		December	0.0	>6.0	0.0-1.0	Very long	Frequent	Very long	Very Frequent
SpA: Spurger	C								
		January	5.0-6.0	>6.0	---	---	None	---	None
		February	5.0-6.0	>6.0	---	---	None	---	None
		December	5.0-6.0	>6.0	---	---	None	---	None
StA: Spurger	C								
		January	5.0-6.0	>6.0	---	---	None	---	None
		February	5.0-6.0	>6.0	---	---	None	---	None
		December	5.0-6.0	>6.0	---	---	None	---	None

Table 19.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
Camptown	D								
		January	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		February	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		March	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		April	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		May	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		June	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		July	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		August	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
		December	0.0	>6.0	0.0-1.0	Very long	Frequent	---	None
TaA:									
Texla	D								
		January	0.5-1.5	1.0-2.0	---	---	None	---	None
		February	0.5-1.5	1.0-2.0	---	---	None	---	None
		March	0.5-1.5	1.0-2.0	---	---	None	---	None
TeB:									
Texla	D								
		January	0.5-1.5	1.0-2.0	---	---	None	---	None
		February	0.5-1.5	1.0-2.0	---	---	None	---	None
		March	0.5-1.5	1.0-2.0	---	---	None	---	None
Evadale	D								
		January	0.0-1.5	0.5-2.5	---	---	None	---	None
		February	0.0-1.5	0.5-2.5	---	---	None	---	None
		March	0.0-1.5	0.5-2.5	---	---	None	---	None
		April	0.0-1.5	0.5-2.5	---	---	None	---	None
		December	0.0-1.5	0.5-2.5	---	---	None	---	None
TgA:									
Texla	D								
		January	0.5-1.5	1.0-2.0	---	---	None	---	None
		February	0.5-1.5	1.0-2.0	---	---	None	---	None
		March	0.5-1.5	1.0-2.0	---	---	None	---	None
Gist	D								
		January	2.0-4.0	2.5-4.0	---	---	None	---	None
		February	2.0-4.0	2.5-4.0	---	---	None	---	None
		March	2.0-4.0	2.5-4.0	---	---	None	---	None
		April	2.0-4.0	2.5-4.0	---	---	None	---	None
		May	2.0-4.0	2.5-4.0	---	---	None	---	None
		November	2.0-4.0	2.5-4.0	---	---	None	---	None
		December	2.0-4.0	2.5-4.0	---	---	None	---	None

Table 19.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
VaA:									
Vamont	D								
		January	0.5-1.5	1.0-2.0	---	---	None	---	None
		February	0.5-1.5	1.0-2.0	---	---	None	---	None
		March	0.5-1.5	1.0-2.0	---	---	None	---	None
VeA:									
Veston	D								
		January	0.0-2.0	>6.0	---	---	None	---	None
		February	0.0-2.0	>6.0	---	---	None	---	None
		March	0.0-2.0	>6.0	---	---	None	---	None
		April	0.0-2.0	>6.0	---	---	None	---	None
		May	0.0-2.0	>6.0	---	---	None	---	None
		June	0.0-2.0	>6.0	---	---	None	Brief	Frequent
		July	0.0-2.0	>6.0	---	---	None	Brief	Frequent
		August	0.0-2.0	>6.0	---	---	None	Brief	Frequent
		September	0.0-2.0	>6.0	---	---	None	Brief	Frequent
		October	0.0-2.0	>6.0	---	---	None	Brief	Frequent
		November	0.0-2.0	>6.0	---	---	None	---	None
		December	0.0-2.0	>6.0	---	---	None	---	None
VtA:									
Viterbo	D								
		January	0.5-1.5	0.5-2.0	---	---	None	---	None
		February	0.5-1.5	0.5-2.0	---	---	None	---	None
		March	0.5-1.5	0.5-2.0	---	---	None	---	None
		April	0.5-1.5	0.5-2.0	---	---	None	---	None
		December	0.5-1.5	0.5-2.0	---	---	None	---	None
ZuA:									
Zummo	D								
		January	0.0	>6.0	0.0-1.5	Very long	Frequent	Very long	Frequent
		February	0.0	>6.0	0.0-1.5	Very long	Frequent	Very long	Frequent
		March	0.0	>6.0	0.0-1.5	Very long	Frequent	Very long	Frequent
		April	0.0	>6.0	0.0-1.5	Very long	Frequent	Very long	Frequent
		May	0.0	>6.0	0.0-1.5	Very long	Frequent	Very long	Frequent
		June	0.0	>6.0	0.0-1.5	Very long	Frequent	Very long	Frequent
		July	0.0	>6.0	0.0-1.5	Very long	Frequent	Very long	Frequent
		August	0.0	>6.0	0.0-1.5	Very long	Frequent	Very long	Frequent
		September	0.0	>6.0	0.0-1.5	Very long	Frequent	Very long	Frequent
		October	0.0	>6.0	0.0-1.5	Very long	Frequent	Very long	Frequent
		November	0.0	>6.0	0.0-1.5	Very long	Frequent	Very long	Frequent
		December	0.0	>6.0	0.0-1.5	Very long	Frequent	Very long	Frequent

Table 20.--Soil Features

(See text for definitions of terms used in this tables. Absence of an entry indicates that the features is not a concern or that data were not estimated.)

Map symbol and soil name	Subsidence		Risk of Corrosion	
	Initial	Total	Uncoated Steel	Concrete
	In	In		
AmA:				
Allemands	8-25	16-51	High	Moderate
AnA:				
Anahuac	0	---	High	Moderate
AsA:				
Anahuac	0	---	High	Moderate
Aris	0	---	High	Moderate
AuA:				
Anahuac	0	---	High	Moderate
Urban Land	0	---	---	---
BaA:				
Bancker	2-4	5-15	High	Moderate
BbA:				
Barbary	3-12	6-15	High	Moderate
BcA:				
Barnett	0	---	High	High
BeA:				
Barnett	0	---	High	High
Bh:				
Beaches	0	---	High	High
BmA:				
Beaumont	0	---	High	High
BnA:				
Bevil	0	---	High	High
BsB:				
Bienville	0	---	Low	High
BtA:				
Bienville	0	---	Low	High
Camptown	0	---	High	High
BwA:				
Bleakwood	0	---	High	High
CaA:				
Camptown	0	---	High	High
CeA:				
Caplen	6-12	6-12	High	High
ChA:				
China	0	---	High	High
CrA:				
Craigen	0	---	Moderate	High

Table 20.--Soil Features--Continued

Map symbol and soil name	Subsidence		Risk of Corrosion	
	Initial	Total	Uncoated Steel	Concrete
	In	In		
CsA:				
Creole	1-3	3-7	High	Moderate
EsA:				
Estes	0	---	High	High
EvA:				
Evadale	0	---	High	High
FaA:				
Fausse	0	---	High	Low
FrA:				
Franeau	0	---	High	Low
HaA:				
Harris	0	---	High	High
ImA:				
Ijam	0	---	High	High
LaA:				
Labelle	0	---	High	Moderate
LbA:				
Labelle	0	---	High	Moderate
Anahuac	0	---	High	Moderate
LcA:				
Labelle	0	---	High	Moderate
Aris	0	---	High	Moderate
LdA:				
Labelle	0	---	High	Moderate
Levac	0	---	High	Moderate
LmA:				
Larose	2-8	5-15	High	Moderate
LtA:				
League	0	---	High	High
LuA:				
League	0	---	High	High
Urban land	0	---	---	---
LvA:				
Leerco	2-4	2-12	High	Moderate
LwA:				
Leton	0	---	High	Moderate
McA:				
Meaton	0	---	High	Moderate
Levac	0	---	High	Moderate
MeA:				
Meaton	0	---	High	Moderate
Spindletop	0	---	High	High
MmA:				
Mollco	0	---	High	High

Table 20.--Soil Features--Continued

Map symbol and soil name	Subsidence		Risk of Corrosion	
	Initial	Total	Uncoated Steel	Concrete
	In	In		
MoA:				
Mollco	0	---	High	High
Craigen	0	---	Moderate	High
MrA:				
Morey	0	---	High	Low
Levac	0	---	High	Moderate
MsA:				
Morey	0	---	High	Low
Spindletop	0	---	High	High
NcC:				
Neches	0	---	Moderate	Low
NeA:				
Neel	0	---	High	High
NuC:				
Neel	0	---	High	High
Urban land	0	---	---	---
OaB:				
Orcadia	0	---	High	High
OcA:				
Orcadia	0	---	High	High
Anahuac	0	---	High	Moderate
OsA:				
Orcadia	0	---	High	High
Aris	0	---	High	Moderate
OuA:				
Orcadia	0	---	High	High
Baines	0	---	High	High
ScA:				
Scatlake	0	6-12	High	Moderate
SpA:				
Spurger	0	---	High	High
StA:				
Spurger	0	---	High	High
Camptown	0	---	High	High
TaA:				
Texla	0	---	High	High
TeB:				
Texla	0	---	High	High
Evadale	0	---	High	High
TgA:				
Texla	0	---	High	High
Gist	0	---	High	High
VaA:				
Vamont	0	---	High	Moderate

Table 20.--Soil Features--Continued

Map symbol and soil name	Subsidence		Risk of Corrosion	
	Initial	Total	Uncoated Steel	Concrete
	In	In		
VeA:				
Veston	0	---	High	High
VtA:				
Viterbo	0	---	High	High
ZuA:				
Zummo	2-12	2-12	High	High

Table 21.--Physical Analyses of Selected Soils

(Analyses by the USDA-NRCS, National Soil Survey Laboratory, Lincoln, Nebraska. Dash indicates the determination was not made.)

Soil Name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very Coarse (2-1 mm)	Coarse (1-0.5 mm)	Medium (0.5-0.25 mm)	Fine (0.25-0.10 mm)	Very fine (0.1-0.05 mm)	Total (2-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Bulk density 1/3-bar	Water content 1/3-bar
	In		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	g/cc	Pct(wt)
Anahuac (1)												
(S90TX-245-020)												
91P00175	0-7	Ap	0.2	0.1	0.2	9.1	43.6	53.2	39.7	7.1	1.47	12.3
91P00176	7-14	A	0.1	0.1	0.4	8.7	41.2	50.5	39.4	10.1	1.59	12.6
91P00177	14-18	E	---	0.1	0.1	6.2	42.6	49.0	42.0	9.0	1.56	10.9
91P00178	18-22	E/Bt	TR	0.1	0.1	6.5	39.7	46.4	41.1	12.5	1.55	13.6
91P00179	22-33	Bt1	---	TR	TR	2.0	19.5	21.5	25.1	53.4	---	---
91P00180	33-40	Bt2	---	TR	0.1	1.5	23.3	24.9	31.0	44.1	1.48	26.9
91P00181	40-54	Btg	---	TR	0.1	1.7	37.1	38.9	31.0	30.1	1.70	17.7
91P00182	54-63	Bt/E1	---	0.1	0.1	8.0	50.2	58.4	23.7	17.9	1.67	16.0
91P00183	63-80	Bt/E2	---	TR	0.1	4.2	46.5	50.8	31.2	18.0	1.66	17.3
Beaumont (1)												
(S90TX-245-021)												
91P00184	0-5	Ap	---	TR	0.1	3.0	13.5	16.6	30.7	52.7	---	---
91P00185	5-9	A	---	TR	TR	3.0	14.2	17.2	30.3	52.5	1.31	33.7
91P00186	9-19	Bg	TR	TR	TR	3.5	16.0	19.5	29.3	51.2	1.31	33.0
91P00187	19-30	Bssg1	---	TR	TR	3.9	16.0	19.9	31.4	48.7	1.31	33.3
91P00188	30-43	Bssg1	---	TR	TR	3.7	13.9	17.6	29.9	52.5	1.36	29.0
91P00189	43-56	Bssg2	---	TR	TR	3.3	13.9	17.2	29.0	53.8	1.40	28.4
91P00190	56-80	Bssg3	TR	TR	TR	2.6	11.8	14.4	28.5	57.1	1.35	30.7
China (1)												
(S90TX-245-023)												
91P00198	0-4	Ap	0.1	TR	0.1	1.1	12.0	13.3	31.7	55.0	1.33	27.9
91P00199	4-9	A1	---	TR	0.1	1.2	10.4	11.7	30.1	58.2	1.25	33.7
91P00200	9-20	A2	---	TR	TR	0.6	5.9	6.5	33.9	59.6	1.21	37.2
91P00201	20-28	Bss1	---	TR	0.1	1.1	10.5	11.7	31.1	57.2	1.29	30.8
91P00202	28-37	Bss2	---	TR	0.1	1.1	9.9	11.1	32.2	56.7	1.31	31.8
91P00203	37-42	Bss3	---	TR	0.1	1.0	10.8	11.9	32.0	56.1	1.29	34.2
91P00204	42-55	Bssy	---	0.1	0.4	1.5	9.7	11.7	29.0	59.3	1.30	35.3
91P00205	55-60	Bssyg	---	0.3	0.5	1.2	7.1	9.1	27.6	63.3	1.36	30.3
91P00206	60-80	Bssg	0.1	0.1	0.1	1.0	8.8	10.1	26.5	63.4	1.33	30.8

See footnotes at end of table.

Table 21.--Physical Analyses of Selected Soils--Continued

Soil Name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very Coarse (2-1 mm)	Coarse (1-0.5 mm)	Medium (0.5-0.25 mm)	Fine (0.25-0.10 mm)	Very fine (0.1-0.05 mm)	Total (2-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Bulk density 1/3-bar	Water content 1/3-bar
	In		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	g/cc	Pct(wt)
Craigen (1)												
(S92TX-245-003)												
93P02294	0-7	A	0.1	0.5	2.5	76.7	8.7	88.5	8.3	3.2	---	---
93P02295	7-17	E1	---	TR	1.0	75.8	11.1	87.9	9.3	2.8	---	---
93P02296	17-24	E2	---	TR	1.0	72.9	10.1	84.0	8.4	7.6	1.64	7.0
93P02297	24-32	E/B	TR	---	0.7	67.8	9.4	77.9	12.1	10.0	1.65	8.2
93P02298	32-37	Bt/E1	0.1	0.1	1.1	67.2	7.1	75.6	7.3	17.1	1.60	9.6
93P02299	37-49	Bt/E2	---	TR	1.1	57.2	8.0	66.3	4.0	29.7	1.51	19.1
93P02300	49-60	Bt/E3	---	TR	1.4	71.1	6.9	79.4	3.2	17.4	1.63	13.8
93P02301	60-72	Btg/E1	---	TR	1.0	65.6	7.7	74.3	3.3	22.4	1.64	14.1
93P02302	72-80	Btg/E2	---	TR	1.3	73.1	8.0	82.4	4.3	13.3	1.72	10.7
Creole (1)												
(S92TX-245-002)												
92P03819	0-7	Oe	---	---	---	----	----	----	----	---	---	---
92P03820	7-13	A	TR	0.2	0.2	1.2	3.6	5.2	38.9	55.9	---	---
92P03821	13-22	Cg1	TR	0.1	0.1	0.1	2.5	2.8	39.8	57.4	---	---
92P03822	22-34	Cg2	TR	TR	0.1	0.1	2.0	2.2	38.4	59.4	---	---
92P03823	34-58	Cg3	TR	TR	0.1	0.1	1.6	1.8	34.1	64.1	---	---
92P03824	58-80	Cg4	TR	TR	0.1	0.1	0.6	0.8	35.1	64.1	---	---
League (1)												
(S92TX-245-004)												
93P02303	0-6	Ap	TR	0.1	0.1	1.3	8.1	9.6	44.9	45.5	1.52	24.3
93P02304	6-11	A	TR	TR	0.1	1.1	6.4	7.6	45.2	47.2	1.50	25.5
93P02305	11-22	Bss1	0.1	TR	0.1	0.9	5.2	6.3	39.9	53.8	1.31	31.8
93P02306	22-30	Bss2	---	TR	TR	1.1	5.5	6.6	39.1	54.3	1.36	28.9
93P02307	30-36	Bss3	---	TR	TR	1.1	6.9	8.0	39.5	52.5	1.37	30.1
93P02308	36-46	Bssg1	0.1	TR	TR	1.0	5.5	6.6	38.4	55.0	1.36	31.8
93P02309	46-59	Bssg2	0.2	0.1	0.1	1.1	5.8	7.3	36.1	56.6	1.50	25.7
93P02310	59-80	Bssg3	0.1	0.1	0.1	1.2	5.9	7.4	32.5	60.1	1.33	32.4

See footnotes at end of table.

Table 21.--Physical Analyses of Selected Soils--Continued

Soil Name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very Coarse (2-1 mm)	Coarse (1-0.5 mm)	Medium (0.5-0.25 mm)	Fine (0.25-0.10 mm)	Very fine (0.1-0.05 mm)	Total (2-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Bulk density 1/3-bar	Water content 1/3-bar
	In		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	g/cc	Pct(wt)
Morey (1)												
(S88TX-245-003)												
89P00445	0-5	Ap	---	---	---	3.9	31.0	34.9	47.8	17.3	1.32	19.5
89P00446	5-9	Bt1	---	---	0.1	3.7	24.8	28.6	46.4	25.0	1.55	23.4
89P00447	9-16	Bt2	---	---	0.1	2.8	22.1	25.0	45.3	29.7	1.51	24.8
89P00448	16-26	Bt3	---	---	0.1	2.8	18.6	21.5	44.3	34.2	1.49	24.8
89P00449	26-36	Bt4	0.2	0.3	0.2	2.7	18.4	21.8	41.6	36.6	1.68	26.7
89P00450	36-49	Btg1	0.1	0.1	0.4	3.1	18.1	21.8	41.2	37.0	1.48	25.9
89P00451	49-55	Btg2	1.1	0.6	0.4	2.9	20.7	25.5	39.2	35.3	1.63	22.3
89P00452	55-80	Btkg	0.4	0.9	0.8	4.4	23.4	30.6	40.1	29.3	1.60	22.7

(1) Location of the sampled pedon is the same as that of the typical pedon described in the section "Soil Series and Their Morphology.”

Table 22.--Chemical Analyses of Selected Soils

(Analysis by National Soil Survey Laboratory, Soil Conservation Service, Lincoln, Nebraska. Dash indicates the determination was not made.TR means trace.)

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Extractable bases: Mg	Extractable bases: K	Extractable bases: Na	CEC (NH_4OAc)	Base Saturation	Organic carbon	pH 1:1 soil:water	Electrical Conductivity	SAR	Exchange-able sodium percentage	Calcium Carbonate Equivalent
	In		Meq/100g					Pct	Pct	pH	mmhos/Cm			Pct
Anahuac (1) (S90TX-245-020)														
	0-7	Ap	5.2	0.6	TR	0.1	6.5	65	1.20	4.8	1.46	TR	1	---
	7-14	A	4.7	0.3	---	TR	5.9	57	0.63	5.2	0.31	1	TR	---
	14-18	E	2.5	0.2	---	TR	4.5	44	0.38	4.7	0.25	1	1	---
	18-22	E/Bt	1.9	0.4	---	TR	5.0	35	0.31	4.6	0.22	1	1	---
	22-33	Bt1	5.6	4.1	0.2	0.6	23.9	36	0.77	5.1	0.18	2	2	---
	33-40	Bt2	6.6	5.1	0.2	0.9	20.4	51	0.50	5.3	0.19	4	4	---
	40-54	Btg	6.0	5.5	0.2	0.9	15.4	72	0.15	5.7	0.16	3	5	---
	54-63	Bt/E1	4.8	4.0	0.1	0.7	10.3	83	0.02	6.1	0.18	4	6	---
	63-80	Bt/E2	5.4	4.7	0.1	0.8	11.2	92	0.03	4.4	0.20	4	7	---
Beaumont (1) (S90TX-245-021)														
	0-5	Ap	19.0	5.4	0.4	0.5	33.0	64	2.09	4.4	---	---	---	---
	5-9	A	19.6	5.1	0.3	0.7	32.4	64	1.42	4.8	---	---	---	---
	9-19	Bg	18.7	4.8	0.3	0.9	30.3	66	0.51	4.6	---	---	---	---
	19-30	Bssg1	17.8	4.8	0.3	1.1	28.9	67	0.28	4.6	---	---	---	---
	30-43	Bssg2	20.4	5.5	0.3	1.2	31.8	71	0.22	4.6	---	---	---	---
	43-56	Bssg3	22.3	5.9	0.3	1.4	33.4	77	0.26	4.6	0.5	---	---	---
	56-80	Bssg4	25.2	6.7	0.4	1.7	36.1	82	0.19	4.6	0.6	---	---	---
China (1) (S90TX-245-023)														
	0-4	Ap	24.9	5.4	0.4	0.8	46.3	68	2.36	4.7	1.6	1	2	---
	4-9	A1	25.2	5.5	0.4	0.9	45.6	70	1.51	4.8	0.9	2	2	---
	9-20	A2	24.8	5.0	0.5	1.0	48.4	65	1.44	4.8	1.1	2	2	---
	20-28	Bg	22.8	4.6	0.3	1.2	43.7	66	0.86	4.7	1.2	2	2	---
	28-37	Bgss1	23.7	4.9	0.4	1.4	43.3	70	0.68	4.7	1.6	2	3	
	37-42	Bgss2	25.2	5.2	0.4	1.6	42.5	76	0.54	4.8	2.2	3	3	---
	42-55	Bgssy1	137.9	5.5	0.3	1.9	153.7	95	0.33	5.0	3.0	2	4	---
	55-60	Bgssy2	114.6	6.3	0.5	2.1	129.7	95	0.15	5.3	2.8	2	4	---
	60-80	B1gss	31.7	7.1	0.5	2.3	46.9	89	0.09	6.0	2.3	2	4	---

See footnotes at end of table.

Table 22.--Chemical Analyses of Selected Soils--Continued

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Extractable bases: Mg	Extractable bases: K	Extractable bases: Na	CEC (NH_4OAc)	Base Saturation	Organic carbon	pH 1:1 soil:water	Electrical Conductivity	SAR	Exchangeable sodium percentage	Calcium Carbonate Equivalent
	In		Meq/100g					Pct	Pct	pH	mmhos/Cm			Pct
Craigen (1) (S92TX-245-003)														
	0-7	A	3.0	0.4	TR	0.1	8.6	41	1.65	4.7	---	---	---	---
	7-17	E1	0.4	0.1	0.1	TR	2.1	29	0.22	5.0	---	---	---	---
	17-24	E2	0.4	TR	0.2	0.5	5.3	21	0.13	4.9	---	---	---	---
	24-32	E/B	0.3	0.1	0.1	0.1	5.0	12	0.09	4.6	---	---	---	---
	32-37	Bt/E1	0.7	0.6	0.1	TR	9.5	15	0.12	4.6	---	---	---	---
	37-49	Bt/E2	3.3	3.5	0.2	0.2	17.7	41	0.16	5.5	---	---	---	---
	49-60	Bt/E3	4.4	3.1	0.3	0.1	10.0	79	0.07	6.2	---	---	---	---
	60-72	Btg/E1	8.8	1.7	0.2	TR	12.6	85	0.09	6.3	---	---	---	---
	72-80	Btg/E2	3.0	1.5	0.3	TR	5.8	83	0.06	5.9	---	---	---	---
Creole (1) (S92TX-245-002)														
	0-7	Oe	20.8	31.1	3.2	19.5	96.4	77	34.20	---	---	---	39	---
	7-13	A	9.4	25.5	2.9	12.6	55.8	90	4.44	7.3	5.2	13	18	---
	13-22	Cg1	8.0	23.4	2.6	18.1	54.6	95	2.06	7.6	8.0	19	25	TR
	22-34	Cg2	7.1	22.3	2.6	20.0	55.8	93	1.11	7.5	8.3	20	29	---
	34-58	Cg3	8.5	26.1	2.5	26.5	67.2	95	1.22	7.7	12.1	27	31	---
	58-80	Cg4	10.7	30.4	3.4	37.1	91.1	90	4.12	5.9	22.9	25	32	---
League (1) (S92TX-245-004)														
	0-6	Ap	17.7	4.0	0.3	0.4	31.6	71	1.18	5.4	---	---	---	---
	6-11	A1	17.9	3.9	0.4	0.6	33.6	68	1.23	5.6	---	---	---	---
	11-22	A2	18.7	4.0	0.3	1.1	37.3	65	0.98	5.5	---	---	---	---
	22-30	Bss1	19.6	4.2	0.3	1.3	38.2	66	0.71	5.4	---	---	---	---
	30-36	Bss2	21.3	4.3	0.2	1.5	33.6	81	0.37	5.8	---	---	---	---
	36-46	Bss3	23.6	4.9	0.3	1.8	34.3	89	0.22	6.2	---	---	---	---
	46-59	Bgss1	25.3	5.0	0.2	2.1	35.1	93	0.17	6.9	---	---	---	---
	59-80	Bgss2	26.5	5.1	0.4	2.2	37.0	92	0.11	7.0	---	---	---	---
Morey (1) (S88TX-245-003)														
	0-5	Ap	14.4	2.2	0.2	0.4	20.6	83	1.11	7.1	0.7	---	3	---
	5-9	Bt1	18.4	3.2	0.2	1.3	25.5	91	1.03	7.1	1.0	5	5	---
	9-16	Bt2	21.1	3.7	0.2	2.2	27.2	100	0.84	7.8	1.4	7	7	---
	16-26	Bt3	20.9	4.2	0.2	3.4	28.7	100	0.51	7.9	1.9	9	10	TR
	26-36	Bt4	25.2	4.7	0.2	4.5	34.6	100	0.35	8.1	1.6	11	12	TR
	36-49	Btg1	19.8	4.7	0.3	5.0	29.8	100	0.23	8.1	1.6	12	14	TR
	49-55	Btg2	---	4.5	0.2	4.8	---	100	0.14	8.4	1.2	13	15	3
	55-80	Btgk	---	3.9	0.2	3.7	---	100	0.05	8.8	1.0	12	15	4

(1) Location of Pedon samples is the same as the pedon given as typical of series in "Soil Series and Their Morphology"

Table 23.--Clay Mineralogy of Selected Soils

(Analysis by the USDA-NRCS, National Soil Survey Laboratory, Lincoln, Nebraska. Dashes indicate none was detected.
Peak size:5=Very large, 4=Large, 3=Medium, 2=Small, 1=Very small, 6=No peaks)

Soil Series and sample number	Depth	Horizon	Clay Minerals (x-ray diffraction) Total Clay fraction, <0.002mm								
			Mica	Smectite	Kaolinite	Quartz	Vermiculite	Goethite	Smectite-Chlorite	Chlorite	Lepidocrocite
	In										
Anahuac (1) (S90TX-245-020)											
91P00175	0-7	Ap	2	3	3	--	---	---	2	---	---
91P00179	33-40	Bt2	2	4	3	--	---	1	1	1	1
91P00183	63-80	Bt/E2	2	4	3	--	---	1	---	---	---
Beaumont (1) (S90TX-245-021)											
91P00184	0-5	Ap	2	3	3	1	---	---	2	---	---
91P00187	19-30	Bssg1	2	4	4	1	---	---	---	---	---
91P00190	56-80	Bssg4	2	4	4	1	---	---	---	---	---
China (1) (S90TX-245-023)											
91P00198	0-4	Ap	2	4	3	1	---	---	---	---	---
91P00201	20-28	Bss1	2	4	3	1	---	---	---	---	---
91P00204	42-55	Bssy	2	4	3	1	---	---	---	---	---
91P00206	60-80	Bssg	2	4	3	2	---	---	---	---	---
Craigen (1) (S92TX-245-003)											
93P02294	0-7	A	---	---	2	1	2	---	---	---	---
93P02298	32-37	Bt/E1	1	2	3	2	2	---	---	---	---
Creole (1) (S92TX-245-002)											
92P03820	7-13	A	3	4	3	1	---	---	---	---	---
92P03822	22-34	Cg2	3	4	3	1	---	1	---	---	---
League (1) (S92TX-245-004)											
93P02303	0-6	Ap	1	4	4	1	---	---	---	---	1
93P02307	22-30	Bss2	1	4	4	1	---	---	---	---	1
Morey (1) (S88TX-245-003)											
89P00445	5-9	Bt1	2	4	3	1	---	---	---	---	---
89P00446	9-16	Bt2	2	3	3	1	---	---	---	---	1
89P00447	16-26	Bt3	2	3	3	1	---	---	---	---	---
89P00450	49-55	Btg1	2	3	3	1	---	---	---	---	---

(1) Location of Pedon samples is the same as the pedon given as typical of series in "Soil Series and Their Morphology"

Table 24.--Engineering Index Test Data

(Analysis by UDSA-NRCS, National Soil Survey Laboratory, Lincoln, Nebraska. Dash indicates the determination was not made.)

Soil name and Sample Number	Horz-ion	Depth	Grain-size distribution: Percentage passing sieve: 5/8 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	Percentage smaller than: 0.02 mm	0.005 mm	0.002 mm	Liquid limit	Plas-ticity index
		In										Pct	
Anahuac (1) (S90TX-245-020)													
91P00175	Ap	0-7	---	100	100	100	100	75	18	11	7	--	NP
91P00176	A	7-14	---	100	100	100	100	76	22	15	10	--	--
91P00177	E	14-18	---	100	100	100	100	79	22	14	9	--	--
91P00178	E/Bt	18-22	---	100	100	100	100	80	25	17	13	19	4
91P00179	Bt1	22-33	---	100	100	100	100	91	60	56	53	--	--
91P00180	Bt2	33-40	---	100	100	100	100	91	51	47	44	55	34
91P00181	Bt3	40-54	---	100	100	100	100	86	38	33	30	--	--
91P00182	Bt/E1	54-63	---	100	100	100	100	75	24	20	18	32	12
91P00183	Bt/E2	63-80	---	100	100	100	100	80	25	21	18	57	31
Beaumont (1) (S90TX-245-021)													
91P00184	Ap	0-5	---	100	100	100	100	91	73	61	53	59	42
91P00185	A	5-9	---	100	100	100	100	91	73	60	53	---	---
91P00186	Bg	9-19	---	100	100	100	100	91	69	58	51	---	---
91P00187	Bssg1	19-30	---	100	100	100	100	91	68	56	49	63	48
91P00188	Bssg2	30-43	---	100	100	100	100	90	71	60	53	---	---
91P00189	Bssg3	43-56	---	100	100	100	100	91	72	61	54	---	---
91P00190	Bssg4	56-80	---	100	100	100	100	92	75	64	57	76	61
China (1) (S90TX-245-023)													
91P00198	Ap	0-4	---	100	100	100	100	93	75	63	55	65	39
91P00199	A1	4-9	---	100	100	100	100	94	77	66	58	---	---
91P00200	A2	9-20	---	100	100	100	100	97	77	67	60	---	---
91P00201	Bss1	20-28	---	100	100	100	100	94	77	65	57	70	53
91P00202	Bss2	28-37	---	100	100	100	100	94	78	65	57	---	---
91P00203	Bss3	37-42	---	100	100	100	100	94	77	64	56	---	---
91P00204	Bssy	42-55	---	100	100	100	100	94	79	67	59	67	50
91P00205	Bssyg	55-60	---	100	100	100	100	95	82	71	63	---	---
91P00206	Bssg	60-80	---	100	100	100	100	95	80	70	63	75	53
Craigen (1) (S92TX-245-003)													
93P02294	A	4-7	---	100	100	100	99	16	8	5	3	---	---
93P02295	E1	7-17	---	100	100	100	100	18	8	5	3	---	---
93P02296	E2	17-24	---	100	100	100	100	22	12	9	8	---	---
93P02297	E/B	24-32	---	100	100	100	100	27	15	12	10	---	---
93P02298	Bt/E1	32-37	---	100	100	100	100	28	22	19	17	---	---
93P02299	Bt/E2	37-49	---	100	100	100	100	38	32	31	30	---	---
93P02300	Bt/E3	49-60	---	100	100	100	100	25	19	18	17	---	---
93P02301	Btg/E1	60-72	---	100	100	100	100	30	24	23	22	---	---
93P02302	Btg/E2	72-80	---	100	100	100	100	22	16	14	13	---	---
Creole (1) (S92TX-245-002)													
92P03819	Oe	0-7	---	---	---	---	---	---	---	---	---	---	---
92P03820	A	7-13	---	100	100	100	100	97	81	66	56	---	---
92P03821	Cg1	13-22	---	100	100	100	100	99	85	68	57	---	---
92P03822	Cg2	22-34	---	100	100	100	100	99	87	70	59	---	---
92P03823	Cg3	34-58	---	100	100	100	100	99	90	74	64	---	---
92P03824	Cg4	58-80	---	100	100	100	100	100	91	75	64	---	---

Table 24.--Engineering Index Test Data—Continued

Soil name and Sample Number	Horz-ion	Depth	Grain-size distribution: Percentage passing sieve: 5/8 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	Percentage smaller than: 0.02 mm	0.005 mm	0.002 mm	Liquid limit	Plas-ticity index
		In										Pct	
League (1) (S92TX-245-004)													
93P02303	Ap	0-6	---	100	100	100	100	95	69	55	46	---	---
93P02304	A	6-11	---	100	100	100	100	96	72	57	47	---	---
93P02305	Bss1	11-22	---	100	100	100	100	97	77	63	54	---	---
93P02306	Bss2	22-30	---	100	100	100	100	97	77	63	54	---	---
93P02307	Bss3	30-36	---	100	100	100	100	96	73	61	53	---	---
93P02308	Bssg1	36-46	---	100	100	100	100	97	76	64	55	---	---
93P02309	Bssg2	46-59	---	100	100	100	100	96	76	64	57	---	---
93P02310	Bssg3	59-80	---	100	100	100	100	96	76	67	60	---	---
Morey (1) (S88TX-245-003)													
89P00445	Ap	0-5	---	100	100	100	100	86	37	25	17	---	---
89P00446	Bt1	5-9	---	100	100	100	100	88	48	34	25	---	---
89P00447	Bt2	9-16	---	100	100	100	100	90	54	39	30	---	---
89P00448	Bt3	16-26	---	100	100	100	100	91	59	44	34	---	---
89P00449	Bt4	26-36	---	100	100	99	98	89	60	46	36	---	---
89P00450	Btg1	36-49	---	100	100	100	100	86	37	25	17	---	---
89P00451	Btg2	49-55	---	100	100	100	100	88	48	34	25	---	---
89P00452	Btkg	55-80	---	100	100	100	100	90	54	39	30	---	---

(1) Location of pedon sample is the same as typical for the series in "Soil Series and Their Morphology"

Table 25.--Classification of the Soils

Soil name	Family or higher taxonomic class
Allemands	Clayey, smectitic, euic, hyperthermic Terric Haplosaprists
Anahuac	Fine, mixed, active, hyperthermic Oxyaquic Glossudalfs
Aris	Fine, smectitic, hyperthermic Typic Glossaqualfs
Baines	Clayey over sandy or sandy-skeletal, smectitic, hyperthermic Typic Endoaquolls
Bancker	Very-fine, smectitic, nonacid, hyperthermic Sodic Hydraquents
Barbary	Very-fine, smectitic, nonacid, hyperthermic Typic Hydraquents
Barnett	Fine, smectitic, nonacid, hyperthermic Vertic Fluvaquents
Beaumont	Fine, smectitic, hyperthermic Chromic Dystraquerts
Bevil	Fine, smectitic, thermic Chromic Dystraquerts
Bienville	Siliceous, thermic Psammentic Paleudalfs
Bleakwood	Fine-loamy, siliceous, active, acid, thermic Fluvaquentic Endoaquepts
Camptown	Fine-silty, siliceous, active, thermic Typic Glossaqualfs
Caplen	Fine, smectitic, nonacid, hyperthermic Typic Hydraquents
China	Fine, smectitic, hyperthermic Oxyaquic Dystruderts
Craigen	Loamy, siliceous, active, thermic Arenic Glossudalfs
Creole	Fine, smectitic, nonacid, hyperthermic Typic Hydraquents
Estes	Fine, smectitic, thermic Aeric Dystraquerts
Evadale	Fine, smectitic, thermic Typic Glossaqualfs
Fausse	Very-fine, smectitic, nonacid, hyperthermic Vertic Endoaquepts
Franeau	Fine, smectitic, hyperthermic Typic Natraquerts
Gist	Coarse-silty, siliceous, superactive, thermic Oxyaquic Glossudalfs
Harris	Fine, smectitic, hyperthermic Vertic Endoaquolls
Ijam	Fine, smectitic, nonacid, hyperthermic Vertic Fluvaquents
Labelle	Fine, smectitic, hyperthermic Oxyaquic Vertic Argiudolls
Larose	Very-fine, smectitic, nonacid, hyperthermic Typic Hydraquents
League	Fine, smectitic, hyperthermic Oxyaquic Dystruderts
Leerco	Fine, smectitic, nonacid, hyperthermic Typic Hydraquents
Leton	Fine-silty, siliceous, superactive, hyperthermic Typic Glossaqualfs
Levac	Fine, smectitic, hyperthermic Oxyaquic Vertic Hapludalfs
Meaton	Fine-silty, siliceous, superactive, hyperthermic Typic Argiaquolls
Mollco	Fine-loamy, siliceous, superactive, thermic Typic Glossaqualfs
Morey	Fine-silty, siliceous, superactive, hyperthermic Oxyaquic Argiudolls
Neches	Coarse-loamy, siliceous, active, nonacid, hyperthermic Typic Udorthents
Neel	Fine, smectitic, nonacid, hyperthermic Mollic Udarents
Orcadia	Fine, smectitic, hyperthermic Oxyaquic Glossudalfs
Sabine	Sandy, siliceous, hyperthermic Oxyaquic Hapludolls
Scatlake	Very-fine, smectitic, nonacid, hyperthermic Sodic Hydraquents
Spindletop	Fine, smectitic, hyperthermic Oxyaquic Argiudolls
Spurger	Fine, mixed, active, thermic Albaquultic Hapludalfs
Texla	Fine-silty, siliceous, superactive, thermic Oxyaquic Glossudalfs
Vamont	Fine, smectitic, thermic Oxyaquic Dystruderts
Veston	Fine-silty, mixed, superactive, nonacid, hyperthermic Typic Fluvaquents
Viterbo	Fine, smectitic, hyperthermic Chromic Vertic Epiaqualfs
Zummo	Fine, smectitic, hyperthermic Vertic Endoaquolls

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